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WILDLIFE REVIEW

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UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE

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WILDLIFE REVIEW

An abstracting service for wildlife management
Issued for the information of cooperators
by the Bureau of Sport Fisheries and Wildlife
Fish and Wildlife Service
UNITED STATES DEPARTMENT OF THE INTERIOR

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CONTENTS

General conservation
Natural resources & climate 2
Soils 3
Conservation education 4
Plants
General, ecology, techniques ... 4
Forest surveys 4
Wildlife
New game series 5
Biotas, ecology, natural history 5
Natural areas & refuges 5
Nature protection & rare & extinct species 5
Morphology, physiology, behavior, migration 5
Effects of chemicals, weather, cars, etc. 6
Parasites & diseases 8
Biometrics 8
Techniques 8
Management & research, general . 11
Hunting areas & problems 11
Introductions 12
Economic & other values 12
Predation, crop damage, control 13
Reports of organizations & reports of harvests 14
Management & ecology of habitats & animals
Wetlands & wildlife 14
Rangeland & wildlife 14
Forestland
Forestry & ecology 15
Management for & damage by wildlife 16
Stripped land & misc. habitats 16
Control of vegetation with herbicides, etc. 15
Mammals
General 16
Mammals
Faunas & manuals 17
Populations, home ranges, communities 17
Parasites & diseases 17
Shrews, moles, bats 18
Rabbits & pikas 19
Rodents
Miscellaneous 21
Rattus & Mus 23
Sciurids 23
Beaver 24
Carnivores
Bears 24
Raccoon, ringtail, coati 25
Mustelids 25
Dogs, wolves, foxes 25
Big game
General 26
Deer (Odocoileus) 30
Marine 34
Other groups 35
Birds
General 36
Morphology, physiology, behavior, migration 36
Manuals, faunas, communities ... 39
Populations & fluctuations 40
Economics, control, mortality .. 41
Parasites & diseases 42
Game birds--general 42
Quail 43
Pheasants 44
Grouse, partridge, etc. 44
Turkey 56
Doves & pigeons 57
Waterfowl 58
Cranes, rails, shorebirds 61
Hawks & owls 62
Blackbirds, starlings, crows ... 62
Other birds 63
Reptiles & amphibians 67
Author index 69

Except as indicated, abstracts are by Kenneth J. Chiavetta, editor,
and Paul A. Stewart, assistant editor.

NATURAL RESOURCES & CLIMATE

Durand, Forrest V. (Tenn. Game & Fish Comm., Nashville.) SMALL WATERSHED PROJECTS AND WILDLIFE. Trans. 28th N. Am. Wildl. Conf. p. 308-313. 1963. WR 112: 2

In the past 20 years, 40 million acres have been drained under the Agricultural Conservation Program to create more agricultural land already in surplus. Much of this (68%) is taking place in the Mississippi Flyway states. Adoption of a watershed program is urged "to conserve and develop every possible natural resource--particularly those in short supply, i.e. water, natural flowing streams, fish and game."

Freeman, Orville L. (Dept. Agr., Washington, D. C.) CONSERVATION FOR WORLD PEACE. Trans. 28th N. Am. Wildl. Conf. p. 49-57. 1963. WR 112: 2

Contains an outline of the Department of Agriculture program to encourage development of private land for recreational use.

Gabrielson, Ira N. (Wildl. Mgmt. Inst., Washington, D. C.) THE JOB AHEAD. Trans. 28th N. Am. Wildl. Conf. p. 18-27. 1963. WR 112: 2

The following resource problems are among the most urgent ones discussed: modernization of policy of Bureau of Land Management, increased research on pesticide effects, development of methods for controlling unwanted birds and of aiding wanted birds of both game and non-game species, and the resolution of problems retarding wetland acquisition.

Hancock, Norman V. (Utah State Dept. Fish & Game, Salt Lake City.) IMPACT OF INTERSTATE HIGHWAYS UPON THE WILDLIFE RESOURCE. Proc. 43rd Ann. Conf. W. Assoc. State Game & Fish Comms. p. 183-187. [1963.] WR 112: 2

Federal highways planned to be completed by 1972 in Utah will use 28,950 acres of land. Present hunter access roads will be made useless through access restrictions of freeways. Increased high speed traffic will account for increased mortality of game. Fences built along these highways will interfere with migrations of big game and pose major law enforcement problems as a result of migrating game congregating at fences.

Harris, Grant A., and Wallace R. Hoffman. (Wash. State Univ., Pullman.) DETERMINING EQUITABLE GRAZING FEES FOR WASHINGTON DEPARTMENT OF NATURAL RESOURCES LAND. J. Range Mgmt. 16(5): 265-272, 4 figs. Sept. 1963. WR 112: 2

Extending over a period of 5 years, the fee for grazing cattle on state-owned land was adjusted upward from $0.50 per animal per month in 1958 to $1.25 in 1963. "Fruits of the program include improved cooperation between department and stockmen, increased income to dependent trusts, increased capital value of state permit range lands, increased livestock gains, reduced trespass grazing, time saved in handling stock, improved ranges without reduction in numbers of permitted stock, promotion of improved relations between neighboring permittees, and increased prestige of the departmental program."

Jahn, Laurence R., chairman. (129 Juneau St., Horicon, Wis.) ANNUAL REPORT OF THE CONSERVATION COMMITTEE [WILSON ORNITHOLOGICAL SOCIETY]. Wilson Bull. 75(3): 295-325. Sept. 1963. WR 112: 2

This long report deals with the following subjects: conservation education, land use problems, habitat polution, migratory bird hunting seasons, control of bird populations and endangered species and subspecies.

Nord, Warren H. (Bur. Sport Fisheries & Wildl., Minneapolis, Minn.) WILDLIFE IN THE SMALL WATERSHED PROGRAM. Trans. 28th N. Am. Wildl. Conf. p. 118-124. 1963. WR 112: 2

A report on participation in the federal Watershed Protection and Flood Prevention Program in the northern mid-western states. Applications (as of 1 June 1962) totalled 237.

U. S. Department of the Interior. THE NATURAL RESOURCES OF COLORADO. Office of the Secretary, Division of Information. 73 p., illus. [1963.] WR 112: 3

This well-illustrated booklet contains sections on the status of Colorado's history, physical characteristics, recreational resources, fish and wildlife, water, power, land, minerals, Indians and geology. Programs of the various natural resource agencies are briefly outlined.

SOILS

Allan, Philip F., Lloyd E. Garland, and R. Franklin Dugan. (SCS, Ithaca, N. Y.) RATING NORTHEASTERN SOILS FOR THEIR SUITABILITY FOR WILDLIFE HABITAT. Trans. 28th N. Am. Wildl. Conf. p. 247-261, 3 figs. 1963. WR 112: 3

Soil maps provide an aid in selection of sites for habitat management, furnish indications of the degree of management needed to produce satisfactory results, provide a means of grouping known soil conditions for broad scale planning toward land acquisition and specialized developments. The wildlife habitat-soils ratings are an aid in showing landowners, in conjunction with soil survey maps of their properties, places where wildlife management measures may be best applied and in helping them in the selection of practices.

Blakley, Earl R., and Paul H. Mohle. SOIL SURVEY OF CHILDRESS COUNTY, TEXAS. SCS, Ser. 1960, no. 5. i + 75 p., 29 figs. + single-fold maps based on aerial photos and bound in. July 1963. Sold by Supt. Documents. WR 112: 3

Includes a section on wildlife.

Burgess, Dent L., and others. SOIL SURVEY OF ROGER MILLS COUNTY, OKLAHOMA. SCS, Ser. 1959, no. 29. i + 69 p., 18 figs. + single-fold maps based on aerial photos and bound in. Aug. 1963. Sold by Supt. Documents. WR 112: 3

Includes a section on wildlife.

Carey, John B., and Michael Yaworkski. SOIL SURVEY OF LEIGH COUNTY, PENNSYLVANIA. SCS, Ser. 1959, no. 31. i + [116] p. + single-fold maps based on aerial photos and bound in. Nov. 1963. Sold by Supt. Documents. WR 112: 3

Includes a section and table on the suitability of the soils as habitats for wildlife.

Jackson, George T., and others. SOIL SURVEY OF PUTNAM COUNTY, TENNESSEE. SCS, Ser. 1960, no. 7. i + 114 p., 21 figs. + single-fold maps based on aerial photos and bound in. Nov. 1963. Sold by Supt. Documents. WR 112: 3

With a section on wildlife.

Lane, Henry C., and others. SOIL SURVEY OF CLAIBORNE COUNTY, MISSISSIPPI. SCS, Ser. 1960, no. 3. i + 56 p., 1 fig. + single-fold maps based on aerial photos and bound in. July 1963. Sold by Supt. Documents. WR 112: 3

Lawrence, Carl B., and others. SOIL SURVEY OF CALHOUN COUNTY, SOUTH CAROLINA. SCS, Ser. 1961, no. 1. i + 135 p., 18 figs. + single-fold maps based on aerial photos and bound in. 1963. Sold by Supt. Documents. WR 112: 3

A 5-page subsection is devoted to the management of soils to attract wildlife.

Milbrandt, Allen C., and others. SOIL SURVEY OF LINCOLN COUNTY, MISSISSIPPI. SCS, Ser. 1960, no. 1. i + 64 p., 9 figs. + single-fold maps based on aerial photos and bound in. May 1963. Sold by Supt. Documents. WR 112: 3

Includes a section on wildlife.

Proffitt, William H., and others. SOIL SURVEY OF HARDIN COUNTY, TENNESSEE. SCS, Ser. 1960, no. 2. i + 134 p., 14 figs. + single-fold maps based on aerial photos and bound in. June 1963. Sold by Supt. Documents. WR 112: 3

Includes a section on wildlife.

SOILS--Continued

Rieger, Samuel, and others. SOIL SURVEY OF FAIRBANKS AREA, ALASKA. SCS, Ser. 1959, no. 25. i + 41 p., 4 figs. + single-fold maps based on aerial photos and bound in. Sept. 1963. Sold by Supt. Documents. WR 112: 4

Weisenberger, B. C., and others. SOIL SURVEY OF BATH COUNTY, KENTUCKY. SCS, Ser. 1959, no. 30. i + 126 p., 11 figs. + single-fold maps based on aerial photos and bound in. Sept. 1963. Sold by Supt. Documents. WR 112: 4

CONSERVATION EDUCATION

Callison, Charles H. (Natl. Audubon Soc., 1130 Fifth Ave., New York, N.Y.) THE NEED FOR HISTORIC PERSPECTIVE IN CONSERVATION. Trans. 28th N. Am. Wildl. Conf. p. 514-524. 1963. WR 112: 4

It is urged that professional training in wildlife conservation should give increased emphasis to the historic background of conservation.

PLANTS--GENERAL, ECOLOGY, TECHNIQUES

Arnol'di, K. V., and L. V. Arnol'di. [ON SOME BASIC CONCEPTS OF ECOLOGY APPLICABLE TO STUDYING A BIOCENOSIS.] In: (Problems of ecology.) Kievsk. Univ. (Kiev.) 4: 6-9. 1962. [From Biol. Abstr. 43(3), 1963, from Referat. Zhur., Biol., 1963, no. 1D9. Transl. of Russian abstr.] WR 112: 4

The concept of the "biocenosis" lacks concreteness and limitation. "Biotope" should be understood to mean parts of a region occupied by certain plant associations and animal colonies which make up the biogeocenosis (ecosystem). The biotope is impossible without the biocenosis and vice versa. The concepts of "zoocenosis" and "phytocenosis" are incorrect since the animal components cannot be separated from the plant components. The author presents analyses of the boundaries for the biocenosis.--From abstr.

Perring, F. H., and S. M. Walters, editors. ATLAS OF THE BRITISH FLORA. Published for Botanical Soc. British Isles by Thomas Nelson & Sons, Ltd. (London). xxiv + 432 p., 1623 maps + 12 transparent overlay maps. 1962. Price 5 pounds 5 shillings. WR 112: 4

Volunteer contributions of data from many of its 1300 members (the Botanical Society of the British Isles) were used in the comprehensive mapping of ranges of the 1623 spp. of plants on the British Isles. The recording unit used was the 10-kilometer square of the National Grid, of which there are more than 3500 squares in the British Isles. More than 1.5 million individual records were machine-processed, with range maps mechanically produced. Twelve transparent overlay maps make it possible for the user of the book to correlate distribution of each species with soil, climate, altitude, etc. The method of data compilation has several built-in tools for error detection. This book may well serve as a model of a method suitable for following changes in animal distribution.

PLANTS--FOREST SURVEYS

Bickford, C. Allen, Carl E. Mayer, and Kenneth D. Ware. (NE Forest Expt. Sta., Upper Darby, Pa.) AN EFFICIENT SAMPLING DESIGN FOR FOREST INVENTORY: THE NORTHEASTERN FOREST RESURVEY. J. Forestry 61(11): 826-833, 1 fig. Nov. 1963. WR 112: 4

The sampling design described was developed at the Northeastern Forest Experiment Station to provide data to meet a pre-set standard of accuracy at least cost for the Forest Survey of the Northeast as the second surveys of these states are made. The principles are equally valid for any extensive forest area of as much as 150 square miles. The essentials of the method are: an initial stratified inventory with some remeasurable plots; remeasurement of some of the initial plots; and establishment of some new plots in a stratified sample.--From abstr.

WILDLIFE--NEW GAME SERIES

EAST AFRICAN WILDLIFE JOURNAL published by the East African Wild Life Society. World List abbreviation: E. Afr. Wildl. J., P. O. Box 20110, Nairobi, Kenya. Vol. I. 131 p. Aug. 1963. $2.50 per issue. Address subscriptions to the Executive Officer. WR 112: 5

"Through the pages of this [fine] Journal, public opinion will be kept informed, experts in other countries kept in touch with East African developments, suggestions advanced for the better management of resources and a basis laid for those policies on which the future of the surviving wildlife of eastern Africa must depend." Abstracts of many of the articles are included in the current issue of Wildlife Review.

WILDLIFE--BIOTAS, ECOLOGY, NATURAL HISTORY

Uspenskii, S. M. FAUNA OF THE ARCTIC. RTS 2173. 16 p. 1962. [From Tech. Transl. 9(11), 1963. Transl. from Russian of Priroda (USSR) 50(8): 33-41. 1961. Available from OTS, Dept. Commerce, Washington 25, D.C., or SLA, John Crerar Library, 35 West 33rd Street, Chicago 16, Ill., at $1.60.] WR 112: 5

WILDLIFE--NATURAL AREAS & REFUGES

Leopold, A. Starker. (Univ. Calif., Berkeley.) STUDY OF WILDLIFE PROBLEMS IN NATIONAL PARKS. Trans. 28th N. Am. Wildl. Conf. p. 28-45. 1963. WR 112: 5

The report on wildlife management in the national parks submitted by the Advisory Board on Wildlife Management for the Secretary of Interior.

WILDLIFE--NATURE PROTECTION & RARE & EXTINCT SPECIES

Calaby, J. H. (Div. Wildl. Res., CSIRO, Canberra, Australia.) AUSTRALIA'S THREATENED MAMMALS. Wildlife 1(1): 15-18, illus. June 1963. WR 112: 5

Many species of Australian mammals have ranges restricted to remote areas, and the compilation of a list of Australian mammals in danger of extinction presents some difficult problems. Six spp. are listed as almost certainly extinct, and 12 endangered spp. are listed as being in need of help.

Williams, Verne O. (Miami Daily News, Miami, Fla.) MAN-MADE DROUTH THREATENS EVERGLADES NATIONAL PARK. Audubon Magazine 65(5): 290-294, illus. Sept.-Oct. 1963. WR 112: 5

A $370,000,000 flood control project of the U. S. Army Corps of Engineers threatens to divert the water supply of Everglades National Park so that "the American people may well have only a few more years in which to view the lush growth of the true Everglades." Artificial pumping is now being done to maintain suitable water levels in the ponds along Anhinga Trail, where visitors view some of the features of the Park.

WILDLIFE--MORPHOLOGY, PHYSIOLOGY, BEHAVIOR, MIGRATION

Adler, Helmut E. (Am. Museum Nat. Hist., Central Park West at 79th St., New York 24.) SENSORY FACTORS IN MIGRATION. Animal Behaviour 11(4): 566-577, 13 figs. Oct. 1963. WR 112: 5

Current theories on animal navigation presuppose abilities which have not been experimentally demonstrated, and some findings suggest the operation of a yet undiscovered cue, particularly in bird navigation. More than 80 references are cited.

Tembrock, Gunter. GRUNDLAGEN DER TIERPSYCHOLOGIE. [BASES OF ANIMAL PSYCHOLOGY.] Akad. Verlag (Berlin W.1., Germany). 206 p., illus. 1963. Price DM 8, paper. [From Biol. Abstr. 43(3), 1963. (In German).] WR 112: 6

This volume with 38 references summarizes the psychology of animal behavior stressing current concepts.--From abstr. by J. G. Scully.

WILDLIFE--EFFECTS OF CHEMICALS, WEATHER, CARS, ETC.

Anonymous. TO REDUCE GNAT POPULATION / CHEMICAL AND BIOLOGICAL CONTROL TO BE COMBINED AT CLEAR LAKE, CALIF. Agr. Chem. 18(9): 37, 189. Sept. 1963. WR 112: 6

After more than a decade of unsuccessfully attempting to chemically control the chaoborid midge (Chaoborus astictopus) attempts with biological control are being made. The lake will be stocked with threadfin shad, brook silverside, Mississippi silverside and Lake Emerald shiner from Okla. Analysis of stomach contents of fish presently found in Clear Lake revealed that the chaoborid midge makes up less than 4% of diet.

Armed Forces Pest Control Board. THE SAFE USE OF PESTICIDES. Armed Forces Pest Control Board, Tech. Inf. Mem. no. 10. 17 p. July 1963. WR 112: 6

Includes a short section containing instructions in use of pesticides with a goal of minimizing wildlife damage.

Boyd, Claude E., S. Bradleigh Vinson, and Denzel E. Ferguson. (Miss. State Univ., State College.) POSSIBLE DDT RESISTANCE IN TWO SPECIES OF FROGS. Copeia 1963(2): 426-429, 1 fig. 14 June 1963. WR 112: 6

Abstract: Possible resistance to DDT is demonstrated in natural populations of cricket frogs (Acris crepitans and A. gryllus). Frogs, classed according to snout-vent length, were tested from several Mississippi localities by exposure to different DDT concentrations for 36 hr. Mortality data for the two species from heavily treated cotton fields and untreated areas were generally lower in populations having a history of exposure to DDT. Field observations following treatment are described where the selective pressures appeared sufficient to have forced expression of resistant genotypes if present in the population.

Butler, Philip A., and Paul F. Springer. (Bur. Commercial Fisheries Biol. Lab., Gulf Breeze, Fla.) PESTICIDES--A NEW FACTOR IN COASTAL ENVIRONMENTS. Trans. 28th N. Am. Wildl. Conf. p. 378-390. 1963. WR 112: 6

Information is summarized on the known effects of pesticides on coastal life from plankton to mammals. Toxicity varies greatly among different organisms and chemicals. Some marine forms appear to be unaffected by recommended or registered pesticidal applications while others are susceptible to poisoning at concentrations of a fraction of a part per billion. Use of less persistent chemicals that are more specific for individual pests and less toxic to non-target organisms offers promise for the future, particularly when integrated with physical and biological methods of control.--From summ.

Ferguson, Denzel E. (Miss. State Univ., State College.) IN LESS THAN 20 YEARS / MISSISSIPPI DELTA WILDLIFE DEVELOPING RESISTANCE TO PESTICIDES. Agr. Chem. 18(9): 32-34. Sept. 1963. WR 112: 6

Tests indicated that frogs and fish with a history of DDT exposure were much more resistant to treatments with DDT, DDD, endrin, dieldrin, heptachlor, aldrin, toxaphene, lindane and methyl parathion than animals with no pesticide-exposure history.

Finley, Robert B., Jr., and Richard E. Pillmore. (Denver Wildl. Res. Center, Denver, Colo.) CONVERSION OF DDT TO DDD IN ANIMAL TISSUE. AIBS Bull. 13(3): 41-42. 1963. WR 112: 7

"From these studies, we conclude that substantial amounts of DDT are converted to DDD in some animal tissues. The usual absence of DDT in liver, or relatively low proportion of DDT to DDD, suggest the liver as the probable principal site of conversion. Studies of the metabolic fate of DDT in man or other animals can only give an incomplete picture if analyses for DDD are not included."

Hunt, Eldridge G. (Calif. Dept. Fish & Game, Sacramento.) PESTICIDE RESIDUES IN FISH AND WILDLIFE POPULATIONS. Proc. 43rd Ann. Conf. W. Assoc. State Game & Fish Comms. p. 129-132. [1963.] WR 112: 7

A brief progress report on work in Calif. on pesticide residues in animal tissues. The average level of DDT residue in fat of wild pheasants was 741 ppm, but one bird contained 2930 ppm.

Lovell, J. Byron. (Agr. Center, American Cyanamid Co., Princeton, N. J.) THE RELATIONSHIP OF ANTICHOLINESTERASE ACTIVITY, PENETRATION, AND INSECT AND MAMMALIAN TOXICITY OF CERTAIN ORGANOPHOSPHORUS INSECTICIDES. J. Economic Entomol. 56(3): 310-317, 1 fig. June 1963. WR 112: 7

Peller, Edith. (Excelsior, Minn.) MINNESOTANS SAVE OIL-DRENCHED WILDFOWL IN OPERATION DUCK RESCUE / LOSSES INCLUDE 10,000 GAME BIRDS, BEAVERS, MUSKRATS. LAWS ARE URGED TO PUNISH POLLUTORS AND PREVENT OIL FLOODING OF THE MISSISSIPPI. Audubon Magazine 65(6): 364-367, illus. Nov.-Dec. 1963. WR 112: 7

Describes efforts to rescue and wash oil-soaked waterfowl in the winter and spring of 1963 when approximately 10,000 birds died at the junction of the Minnesota and Mississippi Rivers following the breaking of a soybean oil tank and a crude oil pipe line.

Pillmore, Richard E., and Robert B. Finley, Jr. (Bur. Sport Fisheries & Wildl., Denver, Colo.) RESIDUES IN GAME ANIMALS RESULTING FROM FOREST AND RANGE INSECTICIDE APPLICATIONS. Trans. 28th N. Am. Wildl. Conf. p. 409-422, 1 fig. 1963. WR 112: 7

Sampling of tissues of game animals from forests treated with DDT for control of spruce budworm revealed the presence of DDT and derived residues in the fat ranging from 0 to 42 parts per million. Other tissues contained lesser amounts of residues. Wide variations in concentrations and total amounts of residue in deer and elk are caused by many factors, including spray area patterns, condition of vegetation, movements and behavior of game species, and physiological condition of the animal.--From summ.

Turtle, E. E., A. Taylor, E. N. Wright, R. J. P. Thearle, H. Egan, W. H. Evans, and N. M. Soutar. (Ministry Agr., Fisheries & Food, Hook Rise, Tolworth, Surbiton, Surrey, England.) THE EFFECTS ON BIRDS OF CERTAIN CHLORINATED INSECTICIDES USED AS SEED DRESSINGS. J. Sci. Food Agr. 14(8): 567-577. Aug. 1963. WR 112: 7

Abstract: In England during the spring, commencing in the year 1956, numbers of deaths occurred amongst wild birds and the insecticides used to dress cereal seeds were suspected. Pigeons were fed with dieldrin, aldrin, heptachlor and γ-BHC and the toxicities and residues in flesh and organs measured. Following this, birds from the field were examined during the 1960/61 sowing season. The results of analyses support the view that dieldrin, aldrin and heptachlor had been mainly responsible for the deaths. An ecological section includes an explanation for the predominance of casualties in the spring time.

WILDLIFE--EFFECTS OF CHEMICALS, WEATHER, CARS, ETC.--Continued

Udagawa, Tatsuo. (Forest Expt. Sta., Tokyo, Japan.) [A FIELD TEST ON THE SPORADIC SCATTERING OF TELODRIN, A NEW RODENTICIDE.] J. Japanese Forest. Soc. 45(2): 39-43. 1963. [From Biol. Abstr. 43(3), 1963. In Japanese with English summary.] WR 112: 8

After estimating the population and the distance of movement of Microtus montabelli by a means of the mark and release method, the rodenticide was sprayed on circles 1.5 m in diameter at intervals of 10 m using 3 preparations: 600-700 cc of solution made by diluting 400 cc of 15% emulsion into 18 liters of water; 100-120 g of 0.5% powder; 100-120 g of 2% powder. Recapture was made in the following and the third night. The percentages of population reduction were 90% with emulsion, with 0.5% powder, and 100% with 2% powder.--Taisitiroo Satoo.

WILDLIFE--PARASITES & DISEASES

Keymer, I. F., J. H. Rose, W. N. Beesley, and S. F. M. Davies. A SURVEY AND REVIEW OF PARASITIC DISEASES OF WILD AND GAME BIRDS IN GREAT BRITAIN. Vet. Record 74(33): 887-894. 1962. [From Helminthol. Abstr. 32(2), 1963.] WR 112: 8

Schmidt, Gerald D. (Colo. State Univ., Fort Collins.) HYMENOLEPIS CALUMNACANTHA SP. NOV. FROM WILSON'S SNIPE, CAPELLA GALLINAGO DELICATA (ORD.) IN COLORADO. Parasitology 53(3,4): 409-411, 3 figs. Nov. 1963. WR 112: 8

Thompson, Wayne H., Daniel O. Trainer, Virginia Allen, and James B. Hale. (Univ. Wis., Madison.) THE EXPOSURE OF WILDLIFE WORKERS IN WISCONSIN TO TEN ZOONOTIC DISEASES. Trans. 28th N. Am. Wildl. Conf. p. 215-225, 1 fig. 1963. WR 112: 8

Epidemiological data and blood samples were collected from 155 Wisconsin Conservation Department workers during 1962. None of the sera neutralized eastern or western encephalitis viruses. Nine sera neutralized St. Louis encephalitis virus, two encephalomyocarditis virus and two vesicular stomatitis virus. Fifty-one of 144 sera neutralized California encephalitis virus. There was lack of histories of encephalitis or related illnesses in these individuals. There was serologic and clinical evidence of tularemia indicating human infection had occurred. No positive evidence of brucellosis was found in this group. Only one serum reacted with leptospira antigens.--From summ.

WILDLIFE--BIOMETRICS

Weiss, G. H. (Rockefeller Inst., N. Y., N. Y.) COMPARISON OF DETERMINISTIC AND A STOCHASTIC MODEL FOR INTERACTION BETWEEN ANTAGONISTIC SPECIES. Biometrics 19(4): 595-602. Dec. 1963. WR 112: 8

An analysis of the stochastic and deterministic theories for a prey-predator situation in which no births are involved. Both theories can be solved in closed form, and the results of the theories can be compared. It is shown that the stochastic theory yields results which approach those of the deterministic theory as the numbers are increased.--From auth. summ. Courtesy/ V. Schultz.

WILDLIFE--TECHNIQUES

Coulson, J. C. (Durham Univ., England.) IMPROVED COLOURED-RINGS. Bird Study 10(2): 109-111. June 1963. WR 112: 8

Colored bands available commercially in England are considered unsatisfactory since the colors fade and there is risk of losing the bands because of abrasion. A hard plastic, sold commercially as "Darvic", is suggested as a better material, and a method is described for home-manufacture of the bands.--From summ.

Dorst, Jean. (Muséum National d'Histoire Naturelle, Paris, France.) LES TECHNIQUES D'ECHANTILLONNAGE DANS L'ETUDE DES POPULATIONS D'OISEAUX. [CENSUS TECHNIQUES IN A BIRD POPULATION STUDY.] La Terre et la Vie 1963(2): 180-202. Apr.-June 1963. In French. WR 112: 9

Gast, James A. (Humboldt State Coll., Arcata, Calif.) RHODAMINE-B DYE FOR STUDYING MOVEMENTS OF ANIMALS. Ecology 44(3): 611-612, 1 fig. Summer 1963. WR 112: 9

Rhodamine-B, an industrial dye, is detectable by fluorescence techniques in concentrations as low as 1 part per 10 billion. This dye is seemingly unaffected by metabolic processes, stability is excellent, and natural sunlight has little effect on its fluorescent characteristics. It, therefore, presents advantages for tagging droppings of wild animals.

Hester, Albert E. (Univ. Mass., Amherst.) A PLASTIC WING TAG FOR INDIVIDUAL IDENTIFICATION OF PASSERINE BIRDS. Bird-Banding 34(4): 213-217, 4 figs. Oct. 1963. WR 112: 9

Numbered nylon tags were used for marking starlings, robins, blue jays and grackles. The nylon tag was attached to the patagium of the bird's wing with a metal poultry wing tag. Letters and numbers were painted on the nylon tag with vinyl plastic finish.

Houston, C. Stuart. (Saskatoon, Saskatchewan, Canada.) R. F. OLDAKER / THE MAN WHO READS GULL BANDS WITH A TELESCOPE. Blue Jay 21(2): 53-57, illus. June 1963. WR 112: 9

With the use of a telescope, bands on more than 1700 gulls were read at the Vancouver, B. C., city dump. Forty-four banding localities were represented. The telescope was 35 - 55x, but the 35x eyepiece was usually used. The telescope was fitted with a homemade finder which was used to locate bands. When a band was centered in the finder it was also centered in the telescope. Much waiting was frequently required before the entire band number could be read. Under 35x magnification, bands could be read at 100 feet. Observations were made showing that nesting gulls traveled approximately 45 miles from their nest to feed, returning to the nest the same day.

Johns, J. E. (Mont. State Univ., Missoula.) A NEW METHOD OF CAPTURE UTILIZING THE MIST NET. Bird-Banding 34(4): 209-213, 6 figs. Oct. 1963. WR 112: 9

The net was erected about 30 inches above water in a horizontal rather than a vertical position. Lead weights were attached to the sides of the net, and the net was allowed to fall to a lower level when the birds were beneath it. Success in capturing phalaropes was much better when the horizontal, rather than the conventional vertical mounting, was used.

Kendeigh, S. Charles. (Univ. Ill., Champaign.) NEW WAYS OF MEASURING THE INCUBATION PERIOD OF BIRDS. Auk 80(4): 453-461. Oct. 1963. WR 112: 9

The incubation period of the house wren, measured in time units, is 14 days or 366 ± 3.5 hours. A definite sum total of heat above a temperature threshold is required for hatching a bird's egg. In the house wren, this is estimated to be 5,867 ± 144 degree-hours or 32.9 kcal. A definite sum total of energy transformation is required by the embryo to complete development to hatching. In the house wren, the energy requirements for the existence and development of the embryo is estimated at 0.9 kcal.--From summ.

Kettlitz, W. K. THE CAPTURE OF GIRAFFES WITHOUT IMMOBILIZATION. Fauna & Flora (13): 25-27, illus. 1962. WR 112: 9

It is sometimes impracticable to use immobilizing methods for capturing giraffes, and capture with horses is still a method which must be used. As many as 10-15 horses are needed because of the high incidence of injuries, but only 5-6 horses are used at one time.

726-464 O - 64 - 2

Sargeant, Alan B., and Berkeley R. Peterson. (Bur. Sport Fisheries & Wildl., St. Paul, Minn.) POCKET GOPHER CONTROL IN MINNESOTA WITH THE MECHANICAL BURROW BUILDER. Bur. Sport Fisheries & Wildl., Branch Predator & Rodent Control & Minn. Dept. Agr. 19 p., 10 figs. [1963.] WR 112: 10

Tractor drawn mechanical burrow builders were found to be effective for controlling pocket gophers in Minn. Grains coated with strychnine alkaloid were placed by the machine in the burrows. One pound of bait/acre coated with 0.25% to 1.0% strychnine alkaloid was more than enough to kill all gophers on areas where tests were made.

Smith, Anthony. BALLOON OVER AFRICA. Africana 1(7): 12-15, illus. Sept. 1963. WR 112: 10

A 55-foot balloon was used for making photographs and observations of African wildlife, and the belief was expressed that the balloon has greater possibilities for use than have yet been exploited. The author thinks that the use of hot air for lifting the balloon has undeveloped possibilities and predicts that "the hot air balloon is about to arrive in a big way."

Smith, Ralph H. (N. Y. State Conserv. Dept., Albany.) EXPERIMENTAL ESTABLISHMENT OF CERTAIN WILDLIFE FOOD PLANTS BY GRAFTING. N. Y. Fish & Game J. 10(2): 215-224. July 1963. WR 112: 10

Abstract: Attempts were made to establish certain crab apple, apple, pear and hawthorn cultivars by grafting them onto wild apple or hawthorn trees and by planting a few that could be purchased as small trees. The object was to obtain early establishment and fruiting to provide winter food for wildlife. Grafting by top-working proved to be the most practical method on the basis of cost, ease of establishment, rapid fruiting and freedom from wildlife damage.

Spitz, F. (Inst. Nat. de la Recherche Agronomique, Jouy-en-Josas, France.) LES TECHNIQUES D'ECHANTILLONNAGE UTILISEES DANS L'ETUDE DE POPULATIONS DE PETITS MAMMIFERES. [CENSUS TECHNIQUES USED IN THE STUDY OF SMALL MAMMAL POPULATIONS.] La Terre et la Vie 1963(2): 203-237, 4 figs. Apr.-June 1963. In French. WR 112: 10

Stains, Howard J. (Southern Ill. Univ., Carbondale.) AUTOMATION IN WILDLIFE PROGRAMS--PRESENT AND FUTURE. Trans. 28th N. Am. Wildl. Conf. p. 262-268. 1963. WR 112: 10

Some of the developments in and some theoretical possibilities for automation in study and management of wildlife are discussed.

Thompson, Richard L., and Burd S. McGinnes. (Va. Coop. Wildl. Res. Unit, Blacksburg.) A COMPARISON OF EIGHT TYPES OF MAST TRAPS. J. Forestry 61(9): 679-680, 1 fig. Sept. 1963. WR 112: 10

Abstract: Seven mast traps as described in the literature were tested by dropping acorns from 35 feet and 55 feet. A polyethylene type trap which was designed and the construction described proved the most reliable, was highly portable, and quite durable after one year in the field. A comparison of costs and durability of the eight types of traps was presented; there was little difference in price but a difference in durability was evident.

Trainer, D. O., V. H. Lee, and R. P. Hanson. (Univ. Wis., Madison.) THE USE OF PAPER DISC ADSORBED BLOOD SAMPLES IN THE SEROLOGIC SURVEILLANCE OF EASTERN VIRAL ENCEPHALITIS. Zoonoses Res. 2(2): 105-116. Aug. 1963. In English with French and German summaries. WR 112: 10

Abstract: One-hundred game farm pheasants of known eastern viral encephalitis history were subjected to a series of environmental treatments designed to simulate blood collection procedures encountered under field conditions. Serum and blood disc samples were secured prior to and after the various environmental treatments were employed, and virus neutralization titers of the samples were determined and compared. The serologic results obtained indicated that the trauma utilized, concussion or gun-shot, did not significantly alter virus neutralization titers. Exposure of carcasses to high

temperature did not adversely affect serologic results; however, the freezing of carcasses prior to the securing of blood disc samples did result in some false positive titers. The existence and interpretation of these "false" reactors is considered and discussed. This study demonstrated that the use of paper disc adsorbed blood samples for the serologic surveillance of eastern viral encephalitis is a reliable laboratory procedure.

WILDLIFE--MANAGEMENT & RESEARCH, GENERAL

Holmes, Edward D. A WILDLIFE MANAGEMENT PLAN FOR THE TIOUGHNIOGA GAME MANAGEMENT AREA. M.S. thesis, State Univ. N. Y., Coll. Forestry. 1962. [Osborn and others. Forest Sci. 9(3), 1963.] WR 112: 11

Lyon, L. Jack. (Intermountain Forest & Range Expt. Sta., Provo, Utah.) ADMINISTRATION OF NATURAL RESOURCES RESEARCH / SOME LESSONS FROM INDUSTRIAL RESEARCH. Am. Inst. Biol. Sci. & Colo. Dept. Game & Fish. [ii] + 62 p., 1 fig. [1963.] WR 112: 11

Resource managers have not paid as much attention as they might to the progress in research administration being made by industrial organizations. Industry has tested methods which represent radical departures from accepted administrative theories, and industrial research has profited from the experience. It seems certain that resource research could profit as well. This paper is based on an extensive literature review and on mail inquiries and personal interviews with more than fifty successful research administrators. In general, four subjects were mentioned in the literature and by the people interviewed. These four (personnel, research atmosphere, organization, and the director of research) form a basic outline for presentation. This booklet should be read by all administrators of wildlife research.--From summ.

PROCEEDINGS OF THE FORTY-SECOND ANNUAL CONFERENCE OF WESTERN ASSOCIATION OF STATE GAME AND FISH COMMISSIONERS, SEATTLE, WASHINGTON, JULY 16-18, 1962. xv + 282 p., mimeo. [1963.] $2.00, paper, from Ben Glading, Calif. Dept. Fish & Game, 722 Capitol Ave., Sacramento 14. WR 112: 11

This paperbound volume contains 72 papers grouped as follows: General Session, 8; Commissioners' Technical Session, 5; Game Management Technical Sessions, 21; Fisheries Technical Sessions, 21; Enforcement and Regulations Session, 12; Committee Reports, 5. Most of the technical game papers are entered in the current issue of WR.

PROCEEDINGS OF THE FORTY-THIRD ANNUAL CONFERENCE OF WESTERN ASSOCIATION OF STATE GAME AND FISH COMMISSIONERS, TUCSON, ARIZONA, JUNE 10-12, 1963. [iv] + 352 p., mimeo. [1963.] $2.00, paper, from Ben Glading, Calif. Dept. Fish & Game, 722 Capitol Ave., Sacramento 14, Calif. WR 112: 11

This paper-bound volume of proceedings contains 58 papers classified as follows: general, 15; commissioners', 6; game management, 14; fisheries, 11; conservation enforcement, 6; information and education, 6. The game management papers are included in this issue of WR.

WILDLIFE--HUNTING AREAS & PROBLEMS

Bizeau, Elwood G. (Idaho Dept. Fish & Game, Boise.) MANAGING UPLAND GAME ON PRIVATE LANDS IN IDAHO. Proc. 42nd Ann. Conf. W. Assoc. State Game & Fish Comms. p. 121-122. 1962 [1963]. WR 112: 11

Free hunting on private land has been opposed in the past by sportsmen, landowners and game administrators, and there is now a surplus of game in Idaho. As the human population increases, the biggest game problem of the future will probably be that of keeping private land open to public hunting.

WILDLIFE--HUNTING AREAS & PROBLEMS--Continued

Dickey, Charley. (Sportsmen's Serv. Bur., Fresno 25, Calif.) SHOOTING PRESERVES IN THE WEST. Proc. 42nd Ann. Conf. W. Assoc. State Game & Fish Comms. p. 132-136. 1962 [1963]. WR 112: 12

During 1961-62 there were 155 licensed shooting preserves in Calif. In 1960-61 there were 109,674 pheasants taken on shooting preserves in that state. "Perhaps the greatest good that has come from the expansion of shooting preserves in America is that the hunter has learned that it is respectable to pay for his recreation."

Greenhalgh, Clifton M. (Utah State Dept. Fish & Game, Kaysville.) UPLAND GAME ON PRIVATE LAND IN UTAH. Proc. 42nd Ann. Conf. W. Assoc. State Game & Fish Comms. p. 123-124. 1962 [1963]. WR 112: 12

"The hunting unit law in Utah allows landholders or any representative group to organize a unit. This area must contain at least 1,000 acres of contiguous land. Thus, some farmers could withhold their land from the unit without impairing the unit's function. The landholders charge $1 for each permit sold on the unit. Some of these units have as many as 30,000 acres and they will sell 3,000 to 4,000 permits. Most units are much smaller in size, and, of course, sell fewer permits."

Harper, Harold T. (Calif. Dept. Fish & Game, Sacramento.) THE FUTURE OF UPLAND GAME HUNTING ON FARM LANDS IN CALIFORNIA. Proc. 42nd Ann. Conf. W. Assoc. State Game & Fish Comms. p. 119-120. 1962 [1963]. WR 112: 12

With proper quail management on a large ranch, income of $8,000-10,000 per year can be realized from sale of hunting rights. With 50,000,000 acres still in public ownership in Calif., the person without farmer friends who is unable to pay for his hunting rights can still find a place to hunt on public land.

WILDLIFE--INTRODUCTIONS

Bump, Gardiner. (Bur. Sport Fisheries & Wildl., Washington, D. C.) STATUS OF THE FOREIGN GAME INTRODUCTION PROGRAM. Trans. 28th N. Am. Wildl. Conf. p. 240-247. 1963. WR 112: 12

A progress report of the Foreign Game Introduction Program.

WILDLIFE--ECONOMIC & OTHER VALUES

Emigh, Frank D. (Dept. Public Utilities, Tacoma, Wash.) PROTECTION OF OPEN RESERVOIRS AGAINST BIRDS. J. Am. Water Works Assoc. 54: 1353-1360, 3 figs. Nov. 1962. [From Public Health Engineering Abstr. 43(9), 1963.] WR 112: 12

The water division of Tacoma, Wash., has found that the most effective method to protect its reservoirs from contamination by birds (sea gulls) is by a water spray system that protects the edges as well as the water surface. The system should be a cyclic-operation type with provision for flexible timing adjustments and should cover at least 50% of the water surface area. A less effective, but simpler method is to stretch wires to form rectangular openings of 40 ft. or less to prevent the gulls from entering the reservoirs in large numbers; this method does not prevent their frequenting coping walls or adjacent areas, however. Shotgun fire was least effective and presented hazards as well as poor public relations.--Charles Green.

Korol'kova, G. E. [THE EFFECT OF BIRDS ON THE NUMBERS OF INSECT PESTS.] Izdat. Akad. Nauk SSSR (Moscow). 126 p. 1963. Price Rubles 0.90. [From Commonwealth Forestry Bur., Centralized Title Serv. Cards, 19 Aug. 1963. In Russian.] WR 112: 12

With 144 references.--Courtesy/ Frank M. Johnson.

Ledger, H. P. ANIMAL HUSBANDRY RESEARCH AND WILDLIFE IN EAST AFRICA. THE DESCRIPTION OF A STANDARDIZED TECHNIQUE FOR THE COMPARISON OF THE BODY AND CARCASE COMPOSITION OF EAST AFRICA'S WILD AND DOMESTIC RUMINANTS WITH OBSERVATIONS ON ITS USE. East African Wildl. J. 1: 18-29, 3 figs. Aug. 1963. WR 112: 13

Butcher's terms and methods were related to East African ruminants, and meat yields were compared. Game animals yielded a higher percentage of lean meat than has been reported for domestic animals. The basis for the difference was not determined, but the water content of the meat was found to be approximately the same in wild and domestic animals.

Zyl, J. H. M. van. THE MEAT PRODUCTION OF SOUTH AFRICAN GAME ANIMALS. 1. THE ELAND. Fauna & Flora (13): 35-40, illus. 1962. WR 112: 13

The total amount of meat yielded by a slaughtered eland was 48.2% of the total weight and 82% of the dressed weight.

WILDLIFE--PREDATION, CROP DAMAGE, CONTROL

Bonilla, J. A., and C. Mezzottoni. [TRIAL OF THE EFFECTIVENESS OF ARASAN AS A BIRD REPELLENT IN PINUS PINASTER SEEDBEDS.] Bol. Dep. For. Uruguay no. 4. p. 11-16. 1963. [From Commonwealth Forestry Bur., Centralized Title Serv. Cards, 12 Aug. 1963. In Spanish.] WR 112: 13

Courtesy/ Frank M. Johnson.

Cocozza, James, and Aurelio Malaga Alba. (Ofic. Sanit. Panamericana, E.U.A. y Mexico, D. F., Mexico.) CONTROL DE DEPREDADORES EN BAJA CALIFORNIA NORTE, MEXICO. [PREDATOR CONTROL IN LOWER NORTH CALIFORNIA, MEXICO.] Bol. Epidemiol. 26(2): 46-52, map. 1962. [From Biol. Abstr. 43(3), 1963. (In Spanish).] WR 112: 13

A program for the elimination of rabies in wild animals which are possible vectors or reservoirs of the disease is given. Statistics are given of the occurrence of the disease in animals in 1959 and 1960 in Mexicali, B. C., Mexico and California, U.S.A.--Irving Fox.

Frings, Hubert, and Mabel Frings. (Univ. Hawaii, Honolulu.) PEST CONTROL WITH SOUND. PART II. THE PROBLEM WITH VERTEBRATES. Sound 2(1): 39-45, 6 figs. Jan.-Feb. 1963. WR 112: 13

A broad view of human problems arising from conflicts with other vertebrates and the possibility of resolving the problems through the use of attracting or repelling sounds. This field has been only slightly explored and great advances are projected by the authors. PART I (POSSIBILITIES WITH INVERTEBRATES) appeared in Sound 1(6): 13-20, Nov.-Dec. 1962. It dealt almost exclusively with the control of invertebrates with sound.

Kverno, Nelson B., and Glenn A. Hood. (Bur. Sport Fisheries & Wildl., Denver, Colo.) EVALUATION PROCEDURES AND STANDARDS / CHEMICAL SCREENING AND DEVELOPMENT FOR FOREST WILDLIFE DAMAGE. Denver Wildl. Res. Center. 59 p., illus. Oct. 1963. WR 112: 13

Since the market for chemical repellents is likely to be small, extensive expenditures for development of such chemicals may be uneconomical for the chemical industry. Accordingly, the Bureau of Sports Fisheries and Wildlife conducts a cooperative testing program. This booklet presents the evaluation procedures and standards for acceptance or rejection of candidate chemicals. Data sheets are given for 4 repellent and 4 lethal compounds.

WILDLIFE--REPORTS OF ORGANIZATIONS & REPORTS OF HARVESTS

Cape of Good Hope. DEPARTMENT OF NATURE CONSERVATION / REPORT NO. 19 / 1962. Provincial Admin., Cape of Good Hope, Dept. Nature Conserv., Cape Town, S. Africa. 140 p., illus. 1962. WR 112: 14

Activities and progress reports are presented from museum services and the following divisions: Inland Fisheries, Fauna and Flora, and Animal Control.

Game Research Association. (53, Northbrook St., Newbury, Berks, England.) THE GAME RESEARCH ASSOCIATION [2ND ANNUAL REPORT 1962 AND LIST OF MEMBERS]. xvi + 81 p., illus. [1963.] WR 112: 14

The chief topics covered in the research report section (p. 12-55) are as follows: mortality among wildlife caused by agricultural chemicals, national game census, national game marking scheme, report on gapes, status of red-legged partridge in Britain, and diseases of reared game birds.

WETLANDS & WILDLIFE

Catts, E. P., F. H. Lesser, R. F. Darsie, Jr., O. Florschutz, and E. E. Tindall. (Univ. Del., Newark.) WILDLIFE USAGE AND MOSQUITO PRODUCTION ON IMPOUNDED TIDAL MARSHES IN DELAWARE, 1956-1962. Trans. 28th N. Am. Wildl. Conf. p. 125-132. 1963. WR 112: 14

Moderate water levels of 9-12 inches in depth are compatible both with low mosquito production and high waterbird usage. After flooding, immature stages of pestiferous Aedes mosquitoes, common to unimpounded marshes, were replaced by Culex species. These Culex mosquitoes occurred most often and in greatest numbers at water depths of from 1-6 inches. Waterbird usages of marshes was increased conspicuously following impoundment. In marshes having moderate water depths, a higher degree of plant-water interspersion appeared to favor resident ducks and brood production. However, in deeper impoundments having large areas of open water, most usage was by migratory waterbirds.--From summ.

Lynch, John J., Charles D. Evans, and V. C. Conover. (U. S. Fish & Wildl. Serv., Lafayette, La.) INVENTORY OF WATERFOWL ENVIRONMENTS OF PRAIRIE CANADA. Trans. 28th N. Am. Wildl. Conf. p. 93-109. 1963. WR 112: 14

An aerial extensive-intensive appraisal of prairie waterfowl environments that was designed to catalog them and map their location and extent. It was estimated that 4% of Canadian prairie lands have permanent utility for nesting ducks, 9% have no utility for nesting ducks. The remaining 87% of the land is rated as temporary (56%), intermittent (23%), and semi-permanent (8%).

RANGELAND & WILDLIFE

King, Calvin L. (Wyo. Game & Fish Comm., Cheyenne.) ANTS THREATEN YOUR WILDLIFE RANGE. Proc. 42nd Ann. Conf. W. Assoc. State Game & Fish Comms. p. 69-72. 1962 [1963]. WR 112: 14

The western harvester ant (Pogonomyrmex occidentalis) destroys all plant seeds and vegetation within the area 3-15 feet from its nest. With an average of as many as 32 nests per acre in some areas, 30% of the range may be destroyed and thus made unavailable to cattle and game. Ants are particularly prevalent in the area occupied as winter range by deer and antelope. A satisfactory method of controlling these ants has not yet been developed.

King, Calvin L. (Wyo. Game & Fish Comm., Cheyenne.) HARVESTER ANT FORAGE UTILIZATION STUDIES IN THE BIG HORN BASIN OF WYOMING. Proc. 43rd Ann. Conf. W. Assoc. State Game & Fish Comms. p. 151-182. [1963.] WR 112: 14

Harvester ants (Pogonomyrmex occidentalis) eat vegetation that would otherwise be available for domestic livestock and wild game. This paper contains observations on the seriousness of the competition imposed and the effectiveness of chemical control on the ants.

FORESTLAND--FORESTRY & ECOLOGY

Gamble, Hays B., and Ronald B. Bartoo. (Pa. State Univ., Univ. Park.) COMPARISON OF TIMBER AND WILDLIFE VALUES AND RETURNS ON FARM WOODLOTS. J. Forestry 61(10): 741-746. Oct. 1963. WR 112: 15

In Sullivan County, Pa., private landowners have little economic justification for making expenditures for wildlife production, and efforts should be directed toward timber production if the goal is maximum financial gain.

CONTROL OF VEGETATION WITH HERBICIDES, ETC.

Bonn, Edward W. (1300 W. Munson, Denison, Texas.) COMMON AQUATIC PLANTS AND THEIR CONTROLS. Proc. Texas Water Sewage Works Assoc. Short Sch. 43: 184-187. 1961. [From Biol. Abstr. 43(3), 1963.] WR 112: 15

Correct identification of plants is needed to avoid destruction of useful plants, and to select the proper herbicide economically. Aquatic plants common in Texas lakes and ponds include Nelumbo lutea, Nymphaea odorata, Brasenia schreberi, Jussiaea diffusa, Eichornia crassipes, Lemna spp., and Potamogeton spp., among floating plants; Sagittaria spp., Dianthera americana, Polygonum spp., Typhia latifolia and T. angustifolia, Scirpus validus, Zizaniopsis milaceae, and Cephalanthus occidentalis, among emerged plants; and Myriophyllum spp., Najas guadalupensis, Ceratophyllum demersum, Chara and Chlorophyceae, among submerged plants. For each of these, tabulated data are presented for characteristics of leaves, stems, flowers and seeds, roots and type of water habitat, and for herbicides, dosage in terms of area, method of application, and additional notes.--From abstr. by H. A. Emerson.

Diem, Kenneth L. (Univ. Wyo., Laramie.) AN EVALUATION OF CHEMICAL AND MECHANICAL REHABILITATION OF DECADENT MOUNTAIN MAHOGANY (CERCOCARPUS MONTANUS). Proc. 43rd Ann. Conf. W. Assoc. State Game & Fish Comms. p. 123-128. [1963.] WR 112: 15

An evaluation of mechanical and chemical treatments of mountain mahogany (Cercocarpus montanus) was conducted from 1960 to 1962 on Sheep Mountain, Albany County, Wyo. The five treatments used were crushing with bulldozer tracks, blading off plant crowns, spraying with one pound 2-4D per acre, spraying with 1.5 pounds of 2-4D per acre and a control. Basal sprouting was significant in 1960 but a general decline of all basal sprouting took place from 1960-1962. The control treatment produced significantly more lateral growth than any of the other treatments in the same three year period.--From abstr.

Frank, P. A., R. H. Hodgson, and R. D. Comes. (Crops Res. Div., Agr. Res. Serv., USDA, Denver, Colo.) EVALUATION OF HERBICIDES APPLIED TO SOIL FOR CONTROL OF AQUATIC WEEDS IN IRRIGATION CANALS. Weeds 11(2): 124-128, 2 figs. Apr. 1963. WR 112: 15

Abstract: Ninety-one herbicides and experimental compounds were evaluated for herbicidal activity on submersed aquatic weeds, Potamogeton pectinatus L. and P. nodosus Poir. Twenty-one of the compounds tested showed some phytotoxicity at 20 lb/A. The other compounds were completely inactive. 2,3,6-trichlorophenylacetic acid (fenac) and 2,6-dichlorobenzonitrile (dichlobenil), showed outstanding activity with good persistence in water-saturated soil. Fenac and 2-(2,4,5-trichlorophenoxy) propionic acid (silvex), were tested in field trials in an irrigation canal in eastern Wyoming. The sodium salt and amide of fenac did not give adequate weed control at 5 lb/A. Spring applications of herbicides did not perform as well as fall ones. Mechanical incorporation of herbicides improved some results, but was of doubtful value.

Hiltibran, Robert C. (Ill. Nat. Hist. Surv., Urbana.) EFFECT OF ENDOTHAL ON AQUATIC PLANTS. Weeds 11(4): 256-257. Oct. 1963. WR 112: 15

Abstract: Disodium endothal (3,6 endoxohexahydrophthalic acid) was applied to a number of emergent and submerged aquatic species and was found to be particularly effective in controlling pondweeds, Potamogeton spp. On P. foliosus, P. crispus, and P. pectinatus, liquid and granular preparations

appeared to be equally effective. Endothal was not very effective on some species, such as waterwillow, Justicia americana, and creeping waterprimrose, Jussiaea repens L. var. glabrescens, although defoliation did occur.

Mayhew, J. K., and Sylvan T. Runkel. (Iowa State Conserv. Comm., Chariton.) THE CONTROL OF NUISANCE AQUATIC VEGETATION WITH BLACK POLYETHYLENE PLASTIC. Proc. Iowa Acad. Sci. 69: 302-307. 1962. WR 112: 16

Abstract: Large sheets of black polyethylene plastic were to control nuisance aquatic vegetation in small farm ponds and lakes. The plastic was floated over vegetation beds and left unattended for a predetermined number of days. Adequate control of all species of Potamogeton was achieved in 10 to 18 days. Ceratophyllum demersum was eliminated in the control plots in 18 to 28 days. Control was unsuccessful for Chara vulgaris and Sagittarius latifolia. All control plots were revegetated with filamentous algae within 30 days after the covering was removed.

FORESTLAND--MANAGEMENT FOR & DAMAGE BY WILDLIFE

Virginia Commission of Game and Inland Fisheries, George Washington National Forest and Jefferson National Forest. COOPERATIVE WILDLIFE MANAGEMENT ON VIRGINIA NATIONAL FORESTS. 24 p., illus. June 1963. WR 112: 16

This booklet was prepared to commemorate the 25th anniversary of the signing of the first formal cooperative wildlife management agreement between the U. S. Forest Service and the Va. Commission of Game and Inland Fisheries. The agreement provided for a charge of $1.00 for hunting, fishing and trapping on the national forests and spending of the funds for protection and restocking of fish and wildlife and for habitat improvement. Wildlife populations were brought from positions near extinction to record abundance. In the 25th year of the cooperative program, 100,000 permits were sold.

STRIPPED LAND & MISCELLANEOUS HABITATS

Riley, Charles V. (Kent State Univ., Kent, Ohio.) REVEGETATION AND MANAGEMENT OF CRITICAL SITES FOR WILDLIFE. Trans. 28th N. Am. Wildl. Conf. p. 269-283. 1963. WR 112: 16

As of Dec. 1961, coal strip-mining had affected approximately 760,000 acres of land in 25 states of the U. S. The strip lands have generally been reclaimed for forestry or grazing. By modifying present reclamation concepts and by instituting basic wildlife management practices, the reclaimed stripped lands can be made more useful for wildlife. Of 85 spp. of plants field-tested in S.E. Ohio, 57 spp. were rated as successful. Chemical conditions on stripped land and on relatively undisturbed land are compared and tabulated. Grasses, legumes, shrubs and vines are evaluated.

MAMMALS--GENERAL

Coulianos, C. C., and A. G. Johnels. (Zool. Inst., Univ. Stockholm, Stockholm, Sweden.) NOTE ON THE SUBNIVEAN ENVIRONMENT OF SMALL MAMMALS. Arkiv Zool. 15(4): 363-370, illus. 1963. [From Biol. Abstr. 43(3), 1963.] WR 112: 16

In certain types of environment, falling snow flakes do not reach the ground, but adhere to vegetation, leaving an air space below the snow cover and the soil. The microclimatic conditions of this subnivean air space have as yet not been studied in detail, but remarkably stable temperature conditions appear to be maintained. An account is given of experiments in which an unmown strip of vegetation was left adjoining an area which had been mowed. After the snow had melted it was evident that small rodents had lived there under the snow.--From abstr. by A. K. Winner.

MAMMALS--GENERAL--Continued

Harrison, J. L. (Dept. Zool., Nanyang Univ., Singapore.) THE NATURAL FOOD OF SOME MALAYAN ANIMALS. Bull. Natl. Museum State Singapore 30: 5-18. 1961. [From Biol. Abstr. 43(3), 1963.] WR 112: 17

From examinations of stomachs collected over the last decade, the feeding habits of 57 spp. of Malaysian mammals are summarized. Most of the rodents (with the exception of the giant squirrels (Ratufa) and the giant flying squirrels, are mixed feeders on both vegetable and insect material.--From auth. abstr.

Sumiński, Piotr. AKLIMATYZACJA SSAKÓW ŁOWNYCH W POLSCE. [ACCLIMATIZATION OF GAME MAMMALS IN POLAND.] Chrońmy Przyrode Ojczysta 19(3): 13-22, 53. May-June 1963. In Polish with English summary. WR 112: 17

Includes discussion of the fallow deer, sika deer, mouflon, muskrat, raccoon-dog and the European rabbit.--From summ.

MAMMALS--FAUNAS AND MANUALS

Golovin, O. V., M. G. Sorokin, A. D. Tarakanov, and L. V. Shaposhnikov. [FAUNA OF THE KALININ OBLAST.] In: (Nature and economy in the Kalinin oblast.) (Kalinin). p. 430-461. 1960. [From Biol. Abstr. 43(3), 1963, from Referat. Zhur., Biol., 1963, no. 1D21. Transl. of Russian abstr.] WR 112: 17

Two species of Cyclostoma, 38 species of fish from 11 families, 10 species of amphibians, 6 species of reptiles, 236 species of birds from 21 orders, and 64 species of wild mammals from 5 orders live in the oblast.--From abstr.

MAMMALS--POPULATIONS, HOME RANGES, COMMUNITIES

Higuchi, Sukesaburo. STUDIES ON POPULATION ECOLOGY CONTROL OF SMALL MAMMALS (1). PATTERN OF DISTRIBUTION AND ITS SHIFT. Bull. Govt. Forest Expt. Sta. (Tokyo, Japan) no. 155. p. 49-73, 9 figs. July 1963. In Japanese with English summary. WR 112: 17

A study in which the trap and release method was used to investigate the distribution of the red-backed vole (Clethrionomys rufocanus bedfordiae). It was considered that sexual pairing and maternal attachments hold the animals together and territoriality restricts their movements. It was further considered that the voles were randomly distributed and that control was to be attained by random distribution of poisoned baits.--From summ.

MAMMALS--PARASITES AND DISEASES

Galuzo, I. G., and A. V. Levit. [TOXOPLASMOSIS IN WILD ANIMALS OF KAZAKHSTAN.] Trudy Inst. Zool. Akad. Nauk Kazakh SSR 16: 3-8. 1962. [From Vet. Bull. 33(6), 1963. In Russian.] WR 112: 17

Ortiz Mariotte, Carlos. (Dir. Epidemiol. y Campañas Sanit., S.S.A., Mexico, D. F., Mexico.) EL PROBLEMA DE LA RABIA EN LA FRONTERA NORTE DE MEXICO. [THE PROBLEM OF RABIES IN THE NORTHERN BORDER OF MEXICO.] Bol. Epidemiol. 26(2): 34-36. 1962. [From Biol. Abstr. 43(3), 1963. (In Spanish).] WR 112: 17

Epidemiological data showing the bat as the cause of rabies in humans is given.--From abstr. by Irving Fox.

Richards, Stephen H. A GUIDE FOR THE RECOGNITION AND CONTROL OF RABIES. N. Dak. Game & Fish Dept. 24 p., illus. 1963. WR 112: 17

Contains numerous photographs and full word descriptions of varied behavior patterns shown by different rabid animals.

726-464 O - 64 - 3

Roth, E. E., Mary Moore, Betty Greer, Kay Newman, W. V. Adams, and G. E. Sanford. (Agr. Exp. Sta., La. State Univ., Baton Rouge.) IDENTIFICATION OF HYOS LEPTOSPIRAL STRAINS ISOLATED IN LOUISIANA WITH REPORT OF A NEW SEROTYPE. Zoonoses Res. 2(2): 91-104. Aug. 1963. In English with French and German summaries. WR 112: 18

Isolated from striped skunks and opossums.

SHREWS, MOLES, BATS

Alarcon Navarro, Francisco. (Dir. Epidemiol. y Campañas Sanit., S.S.A., Mexico, D. F., Mexico.) LA RABIA EN LOS MURCIÉLAGOS. UN NUEVO CAPÍTULO EN LA EPIDEMIOLOGÍA DE LA RABIA. [RABIES IN BATS. A NEW CHAPTER IN EPIDEMIOLOGY OF RABIES.] Bol. Epidemiol. 26(2): 53-60, maps. 1962. [From Biol. Abstr. 43 (3), 1963. (In Spanish).] WR 112: 18

Epidemiological data showing the bite of bats as the cause of 40 human deaths due to rabies in 12 years is given. Maps indicating the zones infected and also the distribution of the bats in the different areas are shown.--Irving Fox.

Henze, [O]. [HELP FOR FOREST BATS.] Allg. Forstz. 18(28): 437-440, 13 photos. 1963. [From Commonwealth Forestry Bur., Centralized Title Serv. Cards, 3 Sept. 1963. In German.] WR 112: 18

Briefly discusses the chief species, their importance in the control of night-flying insects, their habits and enemies, and proposes the use of suitable nesting boxes made of wood and concrete and protected against martens, woodpeckers, etc.--Courtesy/ Frank M. Johnson.

Kay, L., and T. J. Pickvance. (Lanchester Coll. Technol., Coventry, England.) ULTRASONIC EMISSIONS OF THE LESSER HORSESHOE BAT RHINOLOPHUS HIPPOSIDEROS (BECH.). Proc. Zool. Soc. London 141(1): 163-171, 7 figs. July 1963. WR 112: 18

The range of frequencies used by adult bats when congregated in a crowd of 60 or more does not exceed 3 Kc/s; even though their frequency of emission is of the order of 113 Kc/s. The baby bats can make sounds of echo-location type within 3 days of birth; they open their mouths to do so when disturbed and the frequency of the sound at first is about 30 Kc/s.--From auth. abstr.

Okhotina, M. V. [SOME DATA ON THE ECOLOGY OF THE USSURI MOLE (MOGERA ROBUSTA NEHRING).] In: (Problems of ecology.) Vysshaya Shkola (Moscow) 6: 113-114. 1962. [From Biol. Abstr. 43(3), 1963, from Referat. Zhur., Biol., 1962, no. 21I211. Transl. of Russian abstr.] WR 112: 18

The majority of tunnels dug by the moles served forage purposes; passages with packed walls branched off these ducts, with exits into holes containing chambers for resting. The number of tunnels decreased as the mountains rose. At night the moles occasionally climbed to the surface; sometimes they covered distances up to 1000 m in search of shrimps cast ashore with seaweed by the surf. The first period of mole reproduction started in April, and the first litters were seen in the last of May; pregnant moles were again seen at the end of June. According to the degree of tooth wear, the moles were divided into 5 age-groups: the same year's offspring from the 1st or 2nd litter (70% of the population), 1 year-old (18%), 2 years (9%), 3 years (2%) and 4 or more years (1%). Ecto- and endoparasites were enumerated.--From abstr.

Tamsitt, J. R., and Dario Valdivieso. (Univ. Bridgeport, Bridgeport, Conn.) CONDICION REPRODUCTORA DE UNA COLONIA ECUATORIANA DEL MURCIELAGO MYOTIS NEGRO, MYOTIS NIGRICANS NIGRICANS (FAMILIA VESPERTILIONIDAE). [THE REPRODUCTIVE CONDITION OF AN EQUATORIAL COLONY OF LITTLE BLACK BATS, MYOTIS NIGRICANS NIGRICANS (FAMILY VESPERTILIONIDAE).] Caribbean J. Sci. 3(1): 49-51. Mar. 1963. [In Spanish with English abstr.] WR 112: 18

A colony of the black myotis, Myotis nigricans nigricans, was taken in February 1961 at Baños, Ecuador, and adults of both sexes were found to be

reproductively inactive. Several females were lactating and each carried a single young. It is concluded that the species breeds in late December or early January in Ecuador.--From auth. abstr.

Villa-R., Bernardo, and Berta Alvarez L. (Inst. Biol., Univ. Nac. Autónoma de México, México 20, D.F.) RABIES VIRUS IN THE KIDNEY AND OTHER TISSUES OF VAMPIRE BATS IN WESTERN MÉXICO. Zoonoses Res. 2(2): 77-82. Aug. 1963. In English with Spanish summ. WR 112: 19

Abstract: Rabies virus was shown to be present in the kidneys of 9 out of 40 specimens, or 22.5%, of vampire bats (Desmodus rotundus) captured on the Pacific Coast of Mexico. None of these animals showed symptoms of illness. Besides the kidney, the brain, salivary glands, and interscapular gland were also found to be positive for rabies virus by use of Seller's technique, the fluorescent antibody technique, inoculation of mice, or neutralization test. Sixty-five per cent of the 40 vampires proved positive to rabies in one tissue or another that was studied. It was found that the fluorescent antibody technique demonstrated a larger number of positive cases than did the Seller technique. In spite of the high incidence of rabies discovered the virus could not be isolated from any of the tissues studied.

Yudin, B. S. ECOLOGY OF SHREWS (GENUS SOREX) OF WESTERN SIBERIA. JPRS 17973. p. 1-146. 1963. [From Tech. Transl. 9(9), 1963. Transl. from Russian of Akad. Nauk SSSR Biol. Inst. Novosibirsk. Trudy 8: 33-134. 1962. Available from OTS, Dept. Commerce, Washington, D. C., at $2.75.] WR 112: 19

RABBITS AND PIKAS

Besadny, C. D. (Wis. Conserv. Dept., Madison.) WISCONSIN COTTONTAILS. Wis. Conserv. Bull. 28(5): 13-15, illus. Sept.-Oct. 1963. WR 112: 19

The number of cottontails annually bagged in Wis. declined from more than 2 million in the early 1930's to 0.5 million in most recent years. This decline is assumed to be associated with land use, and the author states that "the future of our cottontail population will depend largely upon what happens to wildlife cover on private land in the next few years."

Hesterman, E. R., and C. Kogon. (Div. Wildl. Res., C.S.I.R.O., Canberra, Australia.) ENDOPARASITES OF THE WILD HARE, LEPUS EUROPAEUS PALLAS, IN THE AUSTRALIAN CAPITAL TERRITORY, WITH A NOTE ON BREEDING. C.S.I.R.O. Wildl. Res. 8(1): 21-27, 4 figs. July 1963. WR 112: 19

Coccidia (Eimeria) were found in 82% of 106 hares, Trichostrongylus in 94%, Graphidium strigosum in 6% and Passalurus ambiguus in 2%. The hare does not breed from May to July (the coldest period of the year).--From summ.

Kline, Paul D. (Iowa State Conserv. Comm., Boone.) VERNAL BREEDING OF COTTONTAILS IN IOWA. Proc. Iowa Acad. Sci. 69: 244-252. 1962. WR 112: 19

Abstract: Studies of 399 cottontails (Sylvilagus floridanus mearnsii) taken during late winter and spring of 1958 through 1961 have established the early portion of the breeding season for the species in Iowa. Males attained breeding condition starting in February. Pregnant females occurred late in February. Most females became pregnant for the first time in March. All females examined after April 1 were pregnant. Differences in commencement of the breeding season from one year to another were noted. A statistically significant difference in average size of first and second embryonic litters was noted. Litters from northern Iowa averaged larger than those from southern Iowa. This difference was statistically significant at the 0.20 level of confidence.

Lloyd, H. G. (Ministry Agr., Fisheries & Food, Tangley Place, Worplesdon, Guilford, Surrey, England.) INTRA-UTERINE MORTALITY IN THE WILD RABBIT, ORYCTOLAGUS CUNICULUS (L.) IN POPULATIONS OF LOW DENSITY. J. Animal Ecol. 32 (3): 549-563, 2 figs. Oct. 1963. WR 112: 20

A study of reproduction made during a period of low population density. Observations on breeding are compared with findings obtained on other studies made during periods when high population densities prevailed.

Poole, W. E. (Div. Wildl. Res., C.S.I.R.O., Canberra, Australia.) FIELD ENCLOSURE EXPERIMENTS ON THE TECHNIQUE OF POISONING THE RABBIT, ORYCTOLAGUS CUNICULUS (L.). II. A STUDY OF TERRITORIAL BEHAVIOUR AND THE USE OF BAIT STATIONS. C.S.I.R.O. Wildl. Res. 8(1): 28-35, 3 figs. July 1963. WR 112: 20

When rabbits have well-defined and strongly defended territories they will not, as a rule, cross territorial boundaries to feed at a pile of oat grains in a neighboring territory. With lack of breeding, territorial defense becomes negligible and movement of rabbits over relatively greater distances is mutually tolerated, thus increasing their opportunity of finding and returning to feed at a pile of oats.--From summ.

Poole, W. E. (Div. Wildl. Res., C.S.I.R.O., Canberra, Australia.) FIELD ENCLOSURE EXPERIMENTS ON THE TECHNIQUE OF POISONING THE RABBIT, ORYCTOLAGUS CUNICULUS (L.). III. A STUDY OF TERRITORIAL BEHAVIOUR AND FURROW POISONING. C.S.I.R.O. Wildl. Res. 8(1): 36-51, 4 figs. July 1963. WR 112: 20

Rabbits developed territories when confined in a 2-acre enclosure and were thus confined to parts of the available area and of the furrow where food was provided. Males were distracted from feeding in the furrow by the presence of neighboring males and estrous females. Young kittens and parturient or post-partum females remained near their nests, thus avoiding contact with the furrows. Young, 17 days old, were able to survive after death of the mother. An average of 10 minutes was spent feeding on poisoned carrots before symptoms of poisoning developed, and the rabbits ate an average of 15.9 grams of bait. The best time of the year for furrow-poisoning is in late summer when territorial consciousness in rabbits is minimal.--From summ.

Rowley, Ian. (Div. Wildl. Res., C.S.I.R.O., Canberra, Australia.) BAIT MATERIALS FOR POISONING RABBITS. I. STUDIES ON THE ACCEPTANCE OF BAIT MATERIALS BY CAGED RABBITS. C.S.I.R.O. Wildl. Res. 8(1): 56-61, 1 pl. July 1963. WR 112: 20

Summary: Two groups of bait material were tested to see which were accepted most readily by caged wild rabbits, Oryctolagus cuniculus (L.). Of those materials with a high water content (roots and fruits) carrot was preferred to apple, pear, thistle root, turnip, swede, parsnip, or pumpkin; among the drier materials (grains) oats and barley were preferred to wheat, cracked maize, prepared rabbit-feed pellets, and subterranean clover seed. Soaking the grain before presentation gave inconclusive results, and moreover the moist material makes mechanical distribution of bait difficult.

Rowley, Ian. (Div. Wildl. Res., C.S.I.R.O., Canberra, Australia.) BAIT MATERIALS FOR POISONING RABBITS. II. A FIELD STUDY ON THE ACCEPTANCE OF CARROTS AND OATS BY WILD POPULATIONS OF RABBITS. C.S.I.R.O. Wildl. Res. 8(1): 62-77, 5 figs., 2 pls. July 1963. WR 112: 20

Summary: The examination of some 3000 rabbits, Oryctolagus cuniculus (L.), poisoned at different seasons of the year with two different baits and at two widely different localities, showed a seasonal variation in bait acceptance but little difference between the two areas. Oats and carrot, the two baits offered equally as free-feed and as poisoned bait, differ considerably in their water content (10% and 87%) and it is suggested that water stress during the summer influenced the selection of bait by the rabbits towards the moister material. The quantity of bait consumed depended on the nature of the available natural herbage and varied between locations and seasonally. Evidence is presented to show that rabbits unaccustomed to eating seeds take a considerable time to accept oats as a food; this and the lowered acceptability of oats during the hot dry summer render oats a less reliable bait than carrot for poisoning rabbits in eastern Australia.

Rowley, Ian. (Div. Wildl. Res., C.S.I.R.O., Canberra, Australia.) THE EFFECT ON RABBITS OF REPEATED SUBLETHAL DOSES OF SODIUM FLUOROACETATE. C.S.I.R.O. Wildl. Res. 8(1): 52-55, 1 fig. July 1963. WR 112: 21

Summary: Caged wild rabbits, Oryctolagus cuniculus (L.), were fed sublethal doses of sodium fluoroacetate ("1080") at different levels and at different intervals. Results show that in some circumstances "1080" can accumulate and cause death and that its elimination from the rabbit is a slow process.

Schierbaum, Donald L., and Philip U. Alkon. (N. Y. State Conserv. Dept., Albany.) CHARACTERISTICS OF A SAMPLE OF COTTONTAIL RABBIT HUNTERS IN EASTERN NEW YORK. N. Y. Fish & Game J. 10(2): 125-138, 5 figs. July 1963. WR 112: 21

During a 5-year study in Albany, Columbia and Rensselaer Counties over 200 hunters provided information pertaining to nearly 3,300 cottontail hunts. The "average" hunter made about eight hunts annually throughout the 4.5-month season, mostly on weekends. Each hunt lasted about 3.25 hours during which time he and one companion saw four cottontails and took two, requiring approximately 4 man-hours for each rabbit bagged. When hunting with dogs his hunts were longer, and he saw and took more rabbits. On an hourly basis, however, his take was at least as high without dogs.--From abstr.

Thompson, Harry V. RABBITS. Sunday Times Publ. (London), Animals of Britain no. 21. 28 p., illus. 1963. Price 3s 6d. WR 112: 21

Presumably prepared to inform the general public, this well-illustrated booklet contains a good digest of information on the biology of Oryctolagus cuniculus and its history in various countries.

Weidenmüller, H. [HAEMORRHAGIC SEPTICAEMIA IN HARES.] Berl. Münch Tierärztl. Wschr. 75: 314-315. 1962. [From Vet. Bull. 33(6), 1963. In German with English summary.] WR 112: 21

A haemorrhagic laryngotracheitis occurring in hares in winter and spring, with a death rate of up to 80% was described. Occasional complications included fibrinous pleuritis and pericarditis, sometimes also catarrhal gastroenteritis and peritonitis.

RODENTS--MISCELLANEOUS

Barbash, L. A. [NEW AUTOGRAPH AND AUTOPHOTOGRAPHIC APPARATUS FOR A STUDY OF THE ECOLOGY OF RODENTS.] In: (Data of the planning and methods conference on the protection of vegetation in the Urals and Siberian zones, 1960.) (Novosibirsk). p. 97-98. 1961. [From Biol. Abstr. 43(3), 1963, from Referat. Zhur., Biol., 1962, no. 18I268. Transl. of Russian abstr.] WR 112: 21

A new machine permitted recording a week of animal activity by means of an automatic pricking in a continuously moving 2-m band. It is possible to get simultaneous records from 8 pickups on the common band.

Engström, G., and A. Stenmark. [CONTROL OF VOLES ON A LARGE SCALE: EXPERIMENTS IN 1961-62.] Skogen 50(6): 110-112. 1963. [From Commonwealth Forestry Bur., Centralized Title Serv. Cards, 12 Aug. 1963. In Swedish.] WR 112: 21

Control of water voles and field voles with poison baits proved expensive and not very effective. Data include costs and results of the experiments.--Courtesy/ Frank M. Johnson.

Fisler, George F. (Univ. Calif., Berkeley.) EFFECTS OF SALT WATER ON FOOD AND WATER CONSUMPTION AND WEIGHT OF HARVEST MICE. Ecology 44(3): 604-608. Summer 1963. WR 112: 21

Specimens of Reithrodontomys raviventris halicoetes (a harvest mouse inhabiting salt and brackish marshes) were able to survive in captivity more than a year on sea water, but at a lowered weight level.--From summ.

Fomushkin, V. M. [EXPERIMENT ON THE CONTROL OF WATER FIELD MICE IN CLOSED RESERVOIRS OF THE CITY TYPE.] Zool. Zhur. 40(12): 1899-1900. 1961. [From Biol. Abstr. 43(1), 1963, from Referat. Zhur., Biol., 1962, no. 17I262. Transl. of Russian abstr. Original with English summ.] WR 112: 22

Abstract: Burrows of water field mice (WM) were discovered on the banks of ponds located in one of the central regions of the city of Moscow. During July 13-18, 1958, 31 WM were captured in arch traps. The highest numbers were noted near feeding places of water fowl. Pieces of poisoned carrot (4% zinc phosphide, 3% vegetable oil) were used to exterminate the WM. Bait was spread in burrows and along a grassy bank strip with 5 g pieces every 3-5m. Subsequent fall and spring count indicated complete absence of WM.

Goates, Morris A. (Brigham Young Univ., Provo, Utah.) MITES ON KANGAROO RATS AT THE NEVADA TEST SITE. Brigham Young Univ., Sci. Bull., Biol. Ser. 3(4): 1-12, 2 figs. Oct. 1963. WR 112: 22

A total of 6,208 mites were collected from 1,256 kangaroo rats (Dipodomys merriami and D. microps). One-third as many mites were found on rats in nuclear disturbed areas as in undisturbed areas. Forty percent fewer rats in the nuclear disturbed areas were infested than in undisturbed areas, and only one-third as many mites were found on rats in the disturbed as in the undisturbed areas.--From summ.

Kennerly, Thomas E., Jr. (Arlington State Coll., Arlington, Texas.) GENE FLOW PATTERN AND SWIMMING ABILITY OF THE POCKET GOPHER. Southwestern Nat. 8 (2): 85-88, 1 fig. 31 July 1963. WR 112: 22

Abstract: In contrast to previous reports in the literature, my experiments indicate that gophers (Geomys bursarius) have considerable swimming ability. This fact is important in a consideration of distribution barriers, dispersal, and gene flow in gopher populations.

Layne, James N. (Cornell Univ., Ithaca, N. Y.) A STUDY OF THE PARASITES OF THE FLORIDA MOUSE, PEROMYSCUS FLORIDANUS, IN RELATION TO HOST AND ENVIRONMENTAL FACTORS. Tulane Studies in Zool. 11(1): 1-27, 3 figs. Aug. 1963. WR 112: 22

Eighteen ecto- and 14 endoparasites were recorded. It was concluded that parasitism is not a major factor in the ecology of the Florida mouse and probably has little direct effect in regulating population size.--From abstr.

L'Heritier, M., and F. Spitz. NOTE SUR L'INTERET DE LA "GRILLE DE PIEGEAGE" POUR L'ETUDE DES POPULATIONS DE MICROTUS ARVALIS. [A NOTE ON THE ADVANTAGE OF GRID TRAPPING IN THE STUDY OF POPULATIONS OF MICROTUS ARVALIS.] Symposium Theriologicum, Brno, 26 Aug.-5 Sept. 1960. p. 206-212, 5 figs. 1962. In French with Russian summary. WR 112: 22

McNab, Brian K. (Univ. Fla., Gainesville.) A MODEL OF THE ENERGY BUDGET OF A WILD MOUSE. Ecology 44(3): 521-532, 5 figs. Summer 1963. WR 112: 22

A mathematical model was developed for expressing the energy exchange of a wild-living mouse, and it was suggested that the model could be extended for use on populations of several species and the energy dynamics of a community thus analyzed.--From summ.

Pearson, Oliver P. (Univ. Calif., Berkeley.) HISTORY OF TWO LOCAL OUTBREAKS OF FERAL HOUSE MICE. Ecology 44(3): 540-549, 4 figs. Summer 1963. WR 112: 22

Feral populations of house mice reached densities of 200-300 mice per acre. The population on one study area declined a year earlier than that on a second area 3.5 miles distant. Mus and Microtus populations reached peaks simultaneously on one area but not on the other. Peak populations appeared to be correlated with winter breeding and unusually warm weather in the winter and spring months. One population reached its peak early in the autumn and the other early in the summer. Predation and mortality did not appear prevalent, and emigration was considered the most likely cause of population crashes.--From summ.

Taylor, R. John, and Howard McCarley. (Southeastern State Coll., Durant, Okla.) VERTICAL DISTRIBUTION OF PEROMYSCUS LEUCOPUS AND P. GOSSYPINUS UNDER EXPERIMENTAL CONDITIONS. Southwestern Nat. 8(2): 107-108. 31 July 1963. WR 112: 23

Experiments conducted with caged animals showed no preference in the 2 spp. for low or high nesting places.

Thorpe, Bert D., Nyven J. Marchette, and John B. Bushman. (Epizool. Res., Univ. Utah, Salt Lake City, Utah.) VIRULENCE STUDIES OF PASTEURELLA PESTIS ISOLATES FROM THE GREAT SALT LAKE DESERT. Am. J. Trop. Med. & Hyg. 12(2): 219-222. 1963. [From Biol. Abstr. 43(3), 1963.] WR 112: 23

A strain of Pasteurella pestis was isolated from a tissue pool of 2 Ord kangaroo rats, Dipodomys ordii, trapped in Tooele County, Utah, the second such isolation reported in the literature.--From authors' abstr.

Wecker, Stanley C. (Univ. Mich., Ann Arbor.) THE ROLE OF EARLY EXPERIENCE IN HABITAT SELECTION BY THE PRAIRIE DEER MOUSE, PEROMYSCUS MANICULATUS BAIRDI. Ecol. Monographs 33(4): 307-325, 14 figs. Autumn 1963. WR 112: 23

Choice of field habitat by P. m. bairdi is normally predetermined by heredity, but breeding of 12-20 generations in a laboratory resulted in reduction of hereditary control over habitat selection. Early experience can reinforce the innate behavior pattern, but experience is not a prerequisite for subsequent habitat selection.--From summ.

RATTUS AND MUS

Rowe, F. P. RATS AND MICE IN CORN RICKS. Agriculture 69(7): 322-324. 1962. [From J. Animal Ecol. 32(3), 1963.] WR 112: 23

Abstract: Rats may invade corn ricks, or visit them to feed from up to 1/4 mile away. Regular inspection will detect infestations early, and baits containing Warfarin give good control. Mice may be carried in sheaves, and also invade ricks, mostly between September and November. For control many permanent Warfarin baits should be placed in ricks either as they are being built or as soon as possible afterwards.

SCIURIDS

Dorney, Robert S. (Univ. Wis. Center, Green Bay.) COCCIDIOSIS--INCIDENCE, EPIZOOTIOLOGY IN TWO WISCONSIN SCIURIDAE. Trans. 28th N. Am. Wildl. Conf. p. 207-215, 3 figs. 1963. WR 112: 23

Four spp. of coccidia were studied in the eastern chipmunk and red squirrel in the summer months, 1961 and 1962. Eimeria vilasi and E. tamiasciuri were present in almost all animals studied, while E. wisconsinensis and E. toddi occurred irregularly. In spite of the generally high infection rates, no evidence of direct mortality attributable to coccidiosis was found in these hosts.--From summ.

Gashwiler, Jay S. (Oreg. State Univ., Corvallis.) POUCH CAPACITY OF COOPER'S CHIPMUNKS. Murrelet 44(1): 7-8. Jan.-Apr. 1963. WR 112: 23

Maximum recorded capacity in 5 observations was 6.0 cc.

Pengelley, Eric T., and Kenneth C. Fisher. (Univ. Calif., Riverside.) THE EFFECT OF TEMPERATURE AND PHOTOPERIOD ON THE YEARLY HIBERNATING BEHAVIOR OF CAPTIVE GOLDEN-MANTLED GROUND SQUIRRELS (CITELLUS LATERALIS TESCORUM). Canadian J. Zool. 41(6): 1103-1120, 6 figs. Sept. 1963. WR 112: 23

Abstract: The state of torpidity (hibernation), the food consumption, and the weight of a number of C. lateralis were recorded daily and weekly, respectively, for periods up to 2 years. At ambient temperatures of 32°F, 70°F, and 95-100°F and under constant lighting conditions, all animals displayed an approximately 1-year cyclic variation in weight which roughly paralleled the

consumption of food. Under these constant conditions of light and temperature the animals subjected to 32°F and 70°F hibernated, i.e., their body temperature dropped nearly to the ambient and they became torpid. The body temperature of animals kept at 95-100°F could not drop and these animals did not become torpid. Hibernation could not be induced by removal of food but was greatly prolonged if food was not present in the cages at the time the whole hibernation period was ending. The onset of hibernation could be changed only slightly by changing the day lengths. Hibernation was possible only at a specific stage of the weight cycle. The length of the weight cycle was shortened by exposure to an ambient temperature of 95-100°F. By manipulation of the length of the exposure to the high temperature it was possible to have animals hibernating in summer and active in winter. It was not possible to produce a similar shift in the phase of the weight cycle, and hence of hibernation, by changing the lighting conditions.

BEAVER

Bates, James William. EFFECTS OF BEAVER ON STREAM FLOW. M.S. thesis, Utah State Univ. 87 p. 1963. WR 112: 24

Longley, William H., and John B. Moyle. (Minn. Dept. Conserv., St. Paul.) THE BEAVER IN MINNESOTA. Minn. Dept. Conserv., Pittman-Robertson Proj. W-11-R. 87 p., 30 figs., 24 maps. 1963. WR 112: 24

This bulletin is replete with information on history, economics, natural history and management of the beaver. Much of the information is based on data collected in Minn., but full use is also made of the literature. There are 77 titles listed in the bibliography. The appendix contains 2 articles from other publications: A guide to beaver trapping and pelting by Keith G. Hay and William H. Rutherford, and Grading of beaver pelts and manufacture of fur coats by Wendell G. Swank.

BEARS

Erickson, Albert W., and Donald B. Siniff. (Alaska Dept. Fish & Game, Anchorage.) A STATISTICAL EVALUATION OF FACTORS INFLUENCING AERIAL SURVEY RESULTS ON BROWN BEARS. Trans. 28th N. Am. Wildl. Conf. p. 391-409, 4 figs. 1963. WR 112: 24

Peak activity of bears occurred during the evening, but counts were less variable in the morning. Differences between observers and days were not significant at 0.05 probability level, but differences occurred between replicate squares. Wind velocity was found to adversely affect the numbers of bears counted during observation periods with lowest counts associated with increased wind velocities.

Harrison, George H. (Pa. Game Comm., Harrisburg.) THE KEYSTONE BRUIN. Pa. Game News 35(1): 7-13, illus. Jan. 1964. WR 112: 24

A good popular article containing much information on the natural history of the black bear. A total of 554 bears were killed in Pa. in 1962 when there was a bear population of 1500-2000. In fiscal 1961-1962, Pa. paid $4,338.28 for damages done by bears. Damage to beehives was far in excess of damage to sheep.

RACCOON, RINGTAIL, COATI

Lyall-Watson, Malcolm. (Zool. Soc. London, England.) A CRITICAL RE-EXAMINATION OF FOOD "WASHING" BEHAVIOUR IN THE RACCOON (PROCYON LOTOR LINN.). Proc. Zool. Soc. London 141(2): 371-393, 3 figs. + 1 pl. Sept. 1963. WR 112: 25

Based on a review of the literature and on caged animal experiments, the function and ontogeny of food "washing" behavior was discussed. It was concluded that the term "washing" should be replaced with "dousing," as there is no evidence that cleansing is attained or intended. There is no evidence, also, that food dousing occurs among wild raccoons. "Dousing would seem to be an artificial creation of a natural situation whose function is to allow the expression of a thwarted independent feeding mechanism."

MUSTELIDS

Marshall, William H. (Univ. Minn., St. Paul.) THE ECOLOGY OF MUSTELIDS IN NEW ZEALAND. New Zealand Dept. Sci. & Industrial Res., Inf. Ser. no. 38. 32 p., 12 figs. 1963. 5 shillings. WR 112: 25

Stoats (Mustela erminea), weasels (M. nivalis) and ferrets (M. putoris) were introduced into New Zealand from Europe during 1867-1897 in an effort to control rabbits. These mustelids became generally distributed over the 2 main islands, but they have decreased in recent years with increased rabbit control, using sodium fluoroacetate (1080). The mustelids did not control the rabbits but were dependent on them for success.

Proctor, John. A CONTRIBUTION TO THE NATURAL HISTORY OF THE SPOTTED-NECKED OTTER (LUTRA MACULICOLLIS LICHTENSTEIN) IN TANGANYIKA. East African Wildl. J. 1: 93-102, illus. Aug. 1963. WR 112: 25

With considerable life history information. Although spotted-necked otters eat many fish in Lake Victoria, it is probable that their feeding has little effect on the fish population. Since their flesh is not eaten by humans and their skin is in slight demand, otters are not greatly molested by natives, and they continue to live in a probable primeval ecological equilibrium.

Roth, Earl E., W. V. Adams, G. E. Sanford, Mary Moore, Kay Newman, and Betty Green. (Agr. Expt. Sta., La. State Univ., Baton Rouge.) LEPTOSPIRURIA IN STRIPED SKUNKS. Publ. Health Repts. 78(11): 994-1000. 1963. WR 112: 25

Duration of leptospirurin in naturally infected striped skunks, Mephitis mephitis, was found on the basis of bacteriological evidence to be sufficient to further incriminate striped skunks in the epizootiology of leptospiral infections.--From summ.

DOGS, WOLVES, FOXES

Dudzinski, W., A. Haber, and G. Matuszewski. DIE VERBREITUNG DES MARDER-HUNDES (NYCTEREUTES PROCYONOIDES GRAY) IN POLEN. [THE SPREAD OF THE RACCOON DOG (NYCTEREUTES PROCYONOIDES GRAY) INTO POLAND.] Z. Jagdwiss. 9(3): 98-105, 1 fig. Sept. 1963. [In German with English and French summaries.] WR 112: 25

The raccoon dog is extending its range westward from European USSR. Its advance into Poland is described for the period 1955-1962.

Hornberger, F. W. DER WOLF IN OSTPREUSSEN 1900-1945. [THE WOLF IN EAST PRUSSIA, 1900-1945.] Z. Jagdwiss. 9(3): 81-98, 1 fig. Sept. 1963. [In German with English and French summaries.] WR 112: 25

Janse van Rensburg, Rex D. THE "HUMANE COYOTE-GETTER". Fauna & Flora (13): 8-18, 14 figs. 1962. WR 112: 25

The "coyote-getter" is considered to be a safe, humane, economic and practical means of controlling jackals.

726-464 O - 64 - 4

McIntosh, D. L. (Div. Wildl. Res., C.S.I.R.O., Canberra, Australia.) FOOD OF THE FOX IN THE CANBERRA DISTRICT. C.S.I.R.O. Wildl. Res. 8(1): 1-20, 5 figs. July 1963. WR 112: 26

The European fox (Vulpes vulpes) was introduced into Australia about 1868 and has since spread over most of the mainland. Examination of 409 fox stomachs showed that sheep (mainly carrion) and rabbit were staple foods. Invertebrates (chiefly insects) made up a large part of the diet during the warmer months. Birds and cold-blooded vertebrates were not commonly found in stomachs.--From summ.

BIG GAME, GENERAL

Barmore, William J., Jr. (Natl. Park Serv., Yellowstone Park, Wyo.) BIGHORN SHEEP AND THEIR HABITAT IN DINOSAUR NATIONAL MONUMENT. M.S. thesis, Utah State Univ. 134 p. 1962. WR 112: 26

An outline of the history of bighorn sheep in Dinosaur National Monument, the herd's status in 1959, and a description of its habitat. Topics discussed include: (1) past and present bighorn sheep distribution and abundance, (2) herd size, sex and age composition, and productivity, (3) mortality factors, (4) food habits, (5) interrelationships between bighorn sheep, deer, and domestic livestock, and (6) the topography, vegetation, and condition of bighorn sheep habitat in the Monument. Management recommendations are made.

Bax, P. Napier, and D. L. W. Sheldrick. SOME PRELIMINARY OBSERVATIONS ON THE FOOD OF ELEPHANT IN THE TSAVO ROYAL NATIONAL PARK (EAST) OF KENYA. East African Wildl. J. 1: 40-53, 4 figs. + 2 maps. Aug. 1963. WR 112: 26

Most of the park was formerly covered with dense bushes, but bush stands have been drastically reduced in the past 5 years. Reduction of bushes was caused by elephants near water supplies and by fires started by human honey hunters and game poachers in drier areas. The change of habitat was accompanied by decline of rhinoceros, lesser kudu and other bush dwellers and increase of the plains zebra, oryx and Coke's hartebeest.

Blood, Donald A. (Canadian Wildl. Serv., Edmonton, Alberta.) PARASITES FROM CALIFORNIA BIGHORN SHEEP IN SOUTHERN BRITISH COLUMBIA. Canadian J. Zool. 41(6): 913-918. 1963. WR 112: 26

Seven nematode and two tick species were found during postmortem examination of two adult California bighorns at the Ashnola River, British Columbia. Another nematode and a coccidium were extracted from fecal material by zinc sulphate centrifugal flotation. Protostrongylin lungworm larvae were isolated by the Baermann technique from 80% of 101 fresh bighorn droppings. Little variation in frequency of infection with lungworm larvae was noted among yearling, ewe, and ram groups, but lambs appeared to be freer of the parasite than older animals. Both lambs and yearlings appeared to pass considerably fewer lungworm larvae in their droppings than older animals. The earliest date of collection of an infected lamb dropping was July 6, when the lamb was about 8 weeks old. The bighorn sheep is reported as a new host of the abomasal worm Ostertagia ostertagi.--From auth. abstr.

Brooks, James W. (Alaska Dept. Fish & Game, Juneau.) THE STATUS OF WILDERNESS GAME IN ALASKA. Proc. 43rd Ann. Conf. W. Assoc. State Game & Fish Comms. p. 133-137. [1963.] WR 112: 26

The current population status and future prospects in Alaska are given for moose, caribou, Dall sheep, mountain goat, grizzly, brown and polar bears, and timber wolf. "With proper protection and appropriate harvests, all species of Alaskan game can be maintained at satisfying population levels where the habitat remains intact."

DESERT BIGHORN COUNCIL, SEVENTH ANNUAL MEETING, APRIL 2-4, 1963. xiv + 202 p., mimeo. 1963. $2.00, paper, spiral bound, from Desert Bighorn Council, P.O. Box 440, Las Vegas, Nev. WR 112: 27

Contains the following 28 papers: A history of bighorn sheep in Central Nevada, Merlin A. McColm; Progress and hunt report, Ray Brechbill; Loose end thinking, Ralph E. Welles; Water relationships of desert mammals with special reference to bighorn sheep, William G. Bradley; Exotics and their implications, William Graf; Biological assays, Edmund L. Fountain; The bighorn sheep of Lake Mead National Recreation Area, James Sleznick, Jr.; Some desert bighorn reflections, Gale Monson; The Wynne-Edwards theory applied to desert bighorn sheep, Winston E. Banko; A desert bighorn study: Part one, Norman M. Simmons; A national wildlife service for Mexico, Rodolfo Hernandez Corzo; Bighorn breeding, Oscar V. Deming; Bighorns and papagos, Seymour H. Levy; Significant bighorn slides, Florence B. Welles; Re-establishing native bighorn ranges, Jim Yoakum; Bighorn sheep of the Angeles National Forest, Charles E. Kennedy; A report on the first mid-winter and spring bighorn sheep census in the Santa Rosa Mountains--1962-1963, John D. Goodman; Studies on the effects of the drug succinylcholine chloride on domestic sheep, related to its use as an aid in the capture of desert bighorn sheep, Dennis W. Chew and John D. Goodman; Bighorn skull study, John H. Kiger; Status of transplanted bighorns in Texas, Tom L. Hailey; Report from the Kofa Game Range, Gerald E. Duncan; Some watering characteristics of two penned bighorn sheep on the desert game range, Nevada, William C. Reffalt; Bighorn sheep in Anza Borrego Desert State Park, Dalton E. Merkel; Arizona progress report, Robert A. Jantzen; New Mexico progress report, Phil E. Freeman; A summer waterhole study at Carrizo Spring, Santa Rosa Mountains of Southern California, Mark F. Knudsen; Some comments on the distribution of desert bighorn sheep of the Santa Rosa Mountains of Southern California, John D. Goodman and Mark F. Knudsen; A dye spraying device for marking desert bighorn sheep, Charles G. Hansen.

DesMeules, Pierre. (Min. Tourisme, de la Chasse et de la Pêche, Québec.) LE CARIBOU DE LA CÔTE-NORD ET DE L'UNGAVA / 1950 À 1963. [THE CARIBOU OF CÔTE-NORD AND UNGAVA / 1950-1963.] Carnets de Zool. 23(3): 40-46, illus. Summer 1963. In French. WR 112: 27

In 1951, the estimated population of caribou for this section of Quebec was 3,500. It was projected that the population would be depleted within ten years. The estimated population in 1963 based on aerial surveys is 6,000-9,500 caribou.

Glover, J. (East African Agr. Forestry Res. Sta., Muguga, Kenya.) THE ELEPHANT PROBLEM AT TSAVO. East African Wildl. J. 1: 30-39, 3 figs., 2 maps. Aug. 1963. WR 112: 27

Aerial surveys indicated that there were sometimes more than 10,000 elephants in Tsavo National Park. During the dry season these animals concentrated around water supplies on an area of about 2,500 square miles and did extensive damage to the habitat. Additional water reservoirs are needed in waterless portions of the park, and control of the elephant population is considered essential.

Halloran, Arthur F. (Wichita Mountains Wildl. Refuge, Cache.) HISTORY OF THE WICHITA MOUNTAINS WILDLIFE REFUGE ELK HERD. Proc. Okla. Acad. Sci. 43: 229-232. 1963. WR 112: 27

Native elk were exterminated from the area by 1881. Introduction of stock from Jackson Hole, Wyo., was made in 1911. By 1925 the population had increased to 300 animals, and a high of 480 was reached in 1960. Removals of elk for the period 1925-1962 totaled 1241. Plans are to maintain the herd at a level of about 350 animals.

Jeffrey, Duane Eldro. FACTORS INFLUENCING ELK AND CATTLE DISTRIBUTION ON WILLOW CREEK SUMMER RANGE, UTAH. M.S. thesis, Utah State Univ. 52 p. 1963. WR 112: 27

Kettlitz, W. K. GAME ON FARMS. Fauna & Flora (13): 19-23, illus. 1962. WR 112: 28

Information is given on minimum size of enclosure, type of fence, pasture and cover needed for "farm" production of the blesbok, springbok and impala.

Lamprey, H. F. ECOLOGICAL SEPARATION OF THE LARGE MAMMAL SPECIES IN THE TARANGIRE GAME RESERVE, TANGANYIKA. East African Wildl. J. 1: 63-92, 18 figs. + unnumbered map. Aug. 1963. WR 112: 28

The ecological separation of 14 common ungulate species living in close contact with each other in a Tanganyika game reserve is shown to be achieved by six different factors: the occupation of different vegetation types and broad habitats; the selection of different types of food; the occupation of different areas at the same season; the occupation of the same area at different seasons; the use of different feeding levels in the vegetation; the occupation of different dry season refuges in the Masai area when the competition for food is greatest.--From summ.

Lee, Levon. (N. Mex. Dept. Game & Fish, Santa Fe.) NEW MEXICO'S EXOTIC GAME PROGRAM. Proc. 43rd Ann. Conf. W. Assoc. State Game & Fish Comms. p. 143-146. [1963.] WR 112: 28

Four Siberian ibex (Capra ibex siberica) were imported and are now being held in captivity where efforts will be made to produce offspring to be released into the wild. Plans also call for experimental releases of greater kudu (Strepsiceros strepsiceros) and cape oryx (Oryx gazella gazella).

Ling, H. [ALCES ALCES AND FORESTRY.] Loodusuur. Seltsi Aastar. (Tartu) 1961, no. 54. p. 227-249 + 2 pls. 1962. [From Commonwealth Forestry Bur., Centralized Title Serv. Cards, 12 Aug. 1963. In Estonian with German and Russian summ.] WR 112: 28

An account of elk numbers, distribution and damage in Estonia. With 34 references.--Courtesy/ Frank M. Johnson.

McGowan, John E., Lars Karstad, and N. A. Fish. (Ontario Vet. Coll., Guelph.) LEPTOSPIROSIS IN ONTARIO CERVIDAE. Trans. 28th N. Am. Wildl. Conf. p. 199-206, 1 fig. 1963. WR 112: 28

Serologic evidence of infection with Leptospira pomona has been found in deer (Odocoileus virginianus) and moose (Alces americana) widely distributed in Ontario. Antibodies in animals in areas devoid of farm livestock point to a source of infection in nature. Leptospira pomona was isolated from a naturally infected white-tailed deer and also from her diseased fetus.--From summ.

Michurin, L. N. (Res. Inst. Agr. Far North, Noril'sk, USSR.) [INFESTATION OF THE WILD REINDEER WITH THE LARVAE OF OEDEMAGENA TARANDI L. ON THE TAIMIR PENINSULA.] Zool. Zhur. 42(1): 149-151. 1963. [From Biol. Abstr. 43(1), 1963. (In Russian) with English summ.] WR 112: 28

The degree of the infestation of wild reindeer with the larvae of O. tarandi depends upon air temperature during the flight of the insects. The highest infestation observed on an adult male was 559 larvae. Adult females are the least infested.--From abstr.

Nichols, Lyman, Jr. (Div. Fish & Game, Honolulu, Hawaii.) MANAGEMENT OF THE AXIS DEER IN HAWAII. Proc. 42nd Ann. Conf. W. Assoc. State Game & Fish Comms. p. 90-97. 1962 [1963]. WR 112: 28

Eight axis deer were released on Molokai Island in 1868, and later releases were made on Lanai and Maui Islands. An aerial pre-season inventory in 1961 indicated that there were approximately 650 axis deer on public land of Molokai and 1700 on Lanai. No census of the population on Maui was given. A reasonably detailed history of the axis deer in Hawaii is given in this paper.

Novakowski, N. S., J. G. Cousineau, G. B. Kolenosky, G. S. Wilton, and L. P. E. Choquette. (Canadian Wildl. Serv., Ottawa, Ontario.) PARASITES AND DISEASES OF BISON IN CANADA. II. ANTHRAX EPIZOOTY IN THE NORTHWEST TERRITORIES. Trans. 28th N. Am. Wildl. Conf. p. 233-239, 1 fig. 1963. WR 112: 29

In July and Aug. 1962, 281 bison, from herds totalling some 1,300 animals, died of anthrax in an outbreak of unknown origin in a 700-square-mile area in the region of Hook Lake in Canada's Northwest Territories. The disease occurred in an acute and rapidly fatal form, as well as in a less acute form with many animals recovering. It is concluded that in addition to local influences, the behavior patterns of the bison were a factor of importance in the epizootiology of the disease in this outbreak.--From summ.

Owens, Dwight E. (Colo. Game & Fish Dept., Grand Junction.) USE OF HELICOPTER DURING ELK SEX RATIO AND PRODUCTION COUNTS IN COLORADO. Proc. 42nd Ann. Conf. W. Assoc. State Game & Fish Comms. p. 98-101. 1962 [1963]. WR 112: 29

Helicopters are capable of flying lower and slower than fixed wing planes. They are better adapted for use in aerial sex and age determinations of elk. It is recommended that the same pilot and observer be employed on all counts. Use of a tape recorder eliminates the use of tally counters and allows the observer full-time use of his eyes in obtaining accurate observations. Other information can also be recorded. Aerial photos should be taken to check accuracy of counts. Counts should start one-half hour before sunrise and terminate two hours after sunrise. Two annual counts are considered ample--a pre-season count in Sept. and a post-season count made as soon as possible after the hunting season.

Pengelly, W. Leslie. (Mont. Coop. Wildl. Res. Unit, Missoula.) "THUNDER ON THE YELLOWSTONE." Naturalist 14(2): 18-25, illus. Summer 1963. WR 112: 29

The ecology of overpopulation and the history of population control of the Yellowstone National Park elk herd are discussed. In 1914 there were approximately 35,000 elk in Yellowstone Park on a range that should carry no more than 5,000. In the period 1934-63, a removal of 67,333 animals was effected.

Pruitt, William O. (Univ. Okla., Norman.) LICHEN, CARIBOU AND HIGH RADIATION IN ESKIMOS. Audubon Magazine 65(5): 284-287, illus. Sept.-Oct. 1963. WR 112: 29

"It can be seen that caribou are grossly contaminated with both strontium 90 and cesium 137.... We have no idea how these levels of radiocontamination affect either the genetic or somatic attributes of caribou. Moreover, I do not know of any research being conducted on this."

Reynolds, Hudson G. (Ariz. State Univ., Tempe.) USE OF NATURAL OPENINGS IN A PONDEROSA PINE FOREST OF ARIZONA BY DEER, ELK, AND CATTLE. Rocky Mountain Forest & Range Expt. Sta., Res. Notes no. 78. 4 p., 2 figs. Nov. 1962. WR 112: 29

It was determined that elk and cattle used forest openings more than borders or adjacent forest habitat. Deer used the 3 habitats about equally. Results are based on results of fecal pellet counts made on transects.

Ritchie, A. T. A. THE BLACK RHINOCEROS (DICEROS BICORNIS L.). East African Wildl. J. 1: 54-62, illus. Aug. 1963. WR 112: 29

Contains much information on the life history of the black rhinoceros and stresses the urgent need for protection of this species.

Robinson, Don. (British Columbia Fish & Game Branch, Victoria.) MANAGEMENT OF MOOSE BY POPULATION RATIOS. Proc. 42nd Ann. Conf. W. Assoc. State Game & Fish Comms. p. 81-85. 1962 [1963]. WR 112: 29

Information used in moose management is obtained from hunter questionnaires, compulsory guide reports and checking station operations. The chief information used is ratio of bulls, cows and calves and age distribution of the animals harvested.

Stewart, D. R. M. THE ARABIAN ORYX (ORYX LEUCORYX PALLAS). East African Wildl. J. 1: 103-118, 5 figs. Aug. 1963. WR 112: 30

The advent of the motor car and the availability of modern weapons as a result of World War II has resulted in a tremendous increase in the number of oryxes shot annually, and this animal is now in danger of extinction. The only way to assure this animal's continued existence may be to transfer some individuals to a safer habitat. Throughout its native habitat, the oryx seems always to have been a traditional trophy of Arabs.

Straley, James H. (Wyo. Game & Fish Comm., Pinedale.) THE MANAGEMENT OF MOOSE IN WYOMING. Proc. 42nd Ann. Conf. W. Assoc. State Game & Fish Comms. p. 86-89. 1962 [1963]. WR 112: 30

In the past 21 years, 8371 moose have been harvested in Wyo., and more than half of these were taken in the last 6 years. It is recommended that calves be harvested.

Svanbaev, S. K. THE COCCIDIAL FAUNA OF WILD UNGULATES OF KAZAKHSTAN. 13 p. 1963. [From Tech. Transl. 10(2), 1963. Transl. from Russian of Akad. Nauk Kazakh. SSR Inst. Zool. Trudy 9: 187-197. 1958. Available from OTS, Dept. Commerce, Washington 25, D.C., or SLA, John Crerar Library, 35 West 33rd Street, Chicago 16, Ill., at $1.60.] WR 112: 30

Talbot, Lee M., and Martha H. Talbot. (Univ. Calif., Berkeley.) THE HIGH BIOMASS OF WILD UNGULATES ON EAST AFRICAN SAVANNA. Trans. 28th N. Am. Wildl. Conf. p. 465-476. 1963. WR 112: 30

The wild ungulate species demonstrate preferred diets complementary to--not duplicating--one another. These diets involve both different plant species and different growth stages of the same plants. Diets appear to provide optimum nutrition to which the digestive system of each ungulate species is best adapted. Therefore all parts of the available vegetation can be used efficiently to support the biomass of mixed wild ungulates, while only a small part of that vegetation provides efficient nutrition for domestic livestock.--From summ. & concl.

Talbot, Lee M., and Martha H. Talbot. (Univ. Calif., Berkeley.) THE WILDEBEEST IN WESTERN MASAILAND, EAST AFRICA. Wildl. Monographs no. 12. 88 p., 17 figs. Sept. 1963. WR 112: 30

In the 12,000 square miles of Western Masailand, there are more than a million wild animals of which 203,000 are wildebeests. The wildebeests move about freely and sometimes form gatherings of 200,000 animals. Rutting occurs in April and May, and some 80,000 calves are born annually in Jan. and Feb. (when the plains are green). The calves follow their mothers and move with the herds. There is a population-density related mortality of calves, and as many as half of the calves may be lost soon after birth when animals are concentrated as a result of restricted rainfall. When the calves are 6-7 months old, further loss of calves results from rinderpest. About 20% of the initial calf crop survives making up about 8% of the total herd. About 18,000 adults are annually lost, chiefly to predation by lions. There are about 700 lions in the area. Legal protection is well organized, and poaching can be responsible for only a few thousand animals annually. Each of the various species of herbivores in the area have specific food preferences so that there is no inter-specific competition for food.

DEER (Odocoileus)

Anderson, Roy C. (Ontario Res. Foundation, Toronto, Canada.) THE INCIDENCE, DEVELOPMENT, AND EXPERIMENTAL TRANSMISSION OF PNEUMOSTRONGYLUS TENUIS DOUGHERTY (METASTRONGYLOIDEA: PROTOSTRONGYLIDAE) OF THE MENINGES OF THE WHITE-TAILED DEER (ODOCOILEUS VIRGINIANUS BOREALIS) IN ONTARIO. Canadian J. Zool. 41(5): 775-792, 13 figs. + 21 figs. on 9 pls. July 1963. WR 112: 30

Pneumostrongylus tenuis was found throughout the year in the craniums of 41%

of 172 adult deer examined in Algonquin Park. Incidence was higher in summer (46%) than winter (24%). Two fawns were infected (October and March). Worms also occurred on the spinal dura mater and in veins of the dura.--From abstr.

Arnold, David A., and Louis J. Verme. (Mich. Dept. Conserv., Shingleton.) TEN YEAR'S OBSERVATION OF AN ENCLOSED DEER HERD IN NORTHERN MICHIGAN. Trans. 28th N. Am. Wildl. Conf. p. 422-430. 1963. WR 112: 31

Summary and conclusions: In view of our original objectives, we found that the population dynamics of the enclosure herd were such that on the average the annual increase constitutes 32.8% (nearly a third) of the fall population. In early years when the range was in good condition, production was higher and a higher percentage of the herd could be removed. We found that accidents, predation, and other unforeseen losses would account for removal of about 12% of the fall herd. In order to maintain the herd, a harvest goal approximating 20% would permit a buffer against unforeseen losses. During the harvest, however, it is extremely important to give the utmost consideration to sex and age composition of the small isolated herd. We also found the natural succession of the forest affected the carrying capacity of the enclosure almost as much as did pressure by the deer herd. Future range management in the enclosure will move the plant succession back to a stage that is productive of deer.

Day, Benjamin W., Jr. WINTER BEHAVIOR OF WHITE-TAILED DEER IN NORTH-CENTRAL MAINE. M.S. thesis, Univ. Maine. 151 p. 1963. WR 112: 31

East, Ben. THE DEER WAR. Outdoor Life 132(6): 17-19, 111-114, illus. Dec. 1963. WR 112: 31

A well-told story of the perennial problem of game administrators in obtaining sportsman acceptance of any-sex deer seasons. With the publication of this article, Outdoor Life has performed a notable service to game administrators and to the conservation field.

Hines, William W. (Oreg. State Game Comm., Portland.) RELATIONSHIP OF BLACK-TAILED DEER DENSITY TO CONIFER SURVIVAL. Proc. 43rd Ann. Conf. W. Assoc. State Game & Fish Comms. p. 188-192. [1963.] WR 112: 31

Severity of winter weather as well as deer population density influenced the extent of deer damage to conifer plantings.

Lauppe, Earl. (Calif. Dept. Fish & Game, Sacramento.) A CONTROVERSY AND A QUESTION TOUCHED OFF A STUDY THAT BROUGHT A SOLID, SCIENTIFIC ANSWER TO AN OLD DISPUTE. THE STUDY SHOWED THAT...DEER EAT TREES. Outdoor Calif. 24(9): 5-7, illus. Sept. 1963. WR 112: 31

In 4 years trees exposed to deer browsing grew from an average height of 6.4 inches to an average of 13.3 inches; nearby trees protected from browsing grew from an average of 7.8 inches to 28.5 inches. Much land is removed from effective timber production for an average period of 20 years and may be incurring a loss of $8.00/acre/year. An effective deer-proof fence was made from 2-inch-mesh wire, 6 feet wide. It was erected on a 45-degree slant so that the top of the fence was only 52 inches from the ground.

Lewall, E. F., and I. McT. Cowan. (Cowan: Univ. British Columbia, Vancouver, Canada.) AGE DETERMINATION IN BLACK-TAIL DEER BY DEGREE OF OSSIFICATION OF THE EPIPHYSEAL PLATE IN THE LONG BONES. Canadian J. Zool. 41(4): 629-636 + 1 pl. May 1963. WR 112: 31

Abstract: We have studied 34 skeletons of black-tailed deer, Odocoileus hemionus, of known age to determine the order of epiphysis closure in the long bones of the legs. There is an orderly sequence in this process in which the fore limb slightly precedes the hind limb at each site. The use of 14 epiphyses for each animal and four classes of closures has permitted the development of an index of skeletal maturity which can be used to estimate the age of an individual up to the age of 72 months. Inanition apparently delays epiphysis closure by at least 12 months. Sex differences are uncertain.

Lightfoot, William C., and Vernon Maw. (Oreg. Game Comm., Portland.) TRAPPING AND MARKING MULE DEER. Proc. 43rd Ann. Conf. W. Assoc. State Game & Fish Comms. p. 138-141. [1963.] WR 112: 32

A three-year deer trapping and marking study enabled an evaluation of the efficiency of three types of deer traps, and the degree of retention by ear tags, collars, and bells. Corral traps, California single-gate 'Clover' traps, and a modified 'Clover' trap having slatted wooden panel sides were used to trap 1,197 deer during the four-winter trapping program. Deer were ear tagged with large, round aluminum "Perfect" cattle ear tags and with white and colored plastic "Leader" cattle ear tags. Painted, rectangular sheep bells were hung on 1/4-inch polyethylene rope collars around the animals' necks. Little difference was found in the efficiency of the three types of traps in capturing deer but the panel trap had a lower trapping mortality rate than either the corral trap or the single gate 'Clover' trap. On the basis of records obtained from 80 deer which had been marked from 9 to 12 months, relatively high retention was obtained on the ear tags and bells used as marking devices.--From summ.

Marshall, Charles M., George A. Seaman, and Frank A. Hayes. (Univ. Ga., Athens.) A CRITIQUE ON THE TROPICAL CATTLE FEVER TICK CONTROVERSY AND ITS RELATIONSHIP TO WHITE-TAILED DEER. Trans. 28th N. Am. Wildl. Conf. p. 225-232. 1963. WR 112: 32

Traces the history of control of "Texas Cattle Fever" in southern United States.

Pengelly, W. Leslie. (Mont. State Univ., Missoula.) TIMBERLANDS AND DEER IN THE NORTHERN ROCKIES. J. Forestry 61(10): 734-740, 2 figs. Oct. 1963. WR 112: 32

The current job of the deer manager is to achieve proper utilization of existing herds before trying to increase base herds. Logging is the most effective and least expensive habitat management tool available to the deer manager, but logging plans designed specifically to aid deer are not expected soon because of the current disparity between the economic value of timber and deer. White-tailed deer prefer to winter near valley bottoms and on south- and west-facing timbered slopes, and here they constitute a serious threat to pine forest regeneration, especially when herds are improperly managed. Shortened rotations used in intensive silviculture may benefit deer by constantly providing early successional growth.

Reynolds, Hudson G. (Ariz. State Univ., Tempe.) EFFECT OF LOGGING ON UNDERSTORY VEGETATION AND DEER USE IN A PONDEROSA PINE FOREST OF ARIZONA. Rocky Mountain Forest & Range Expt. Sta., Res. Notes no. 80. 7 p., 3 figs. Dec. 1962. WR 112: 32

Understory vegetation was estimated in pounds per acre for a measure of deer food available, and accumulated deer pellets were counted as a measure of deer use at different intervals after logging. During the first year after logging, perennial grasses and sedges were reduced, but forbs and aspen sprouts were increased slightly. Understory vegetation reached peak production about 6 years after logging, and continued higher than on unlogged areas for at least 11 and possibly up to 15 years. Ridgetop aspects and dense pole-size stands of timber produced the least understory vegetation. Deer use was lower on logged than on unlogged areas for the first 2 years after logging. Between 3 and 11 years after logging, however, deer use was several times higher on logged areas. Deer use was found to be comparatively low in pole-size timber, on ridgetops, and where perennial grasses and sedges dominated the understory. --From summ.

Roberts, Harvey A. (Pa. Game Comm., Harrisburg.) WHY CHECK THE DEER KILL? Pa. Game News 34(11): 13-16, illus. Nov. 1963. WR 112: 32

Presenting data obtained at roadside checking stations along with some of the implications of the data, this short but well-written article should do much to help convince hunters that their stops at checking stations are likely to be worthwhile.

Severinghaus, C. W. (R. D. 2, Voorheesville, N. Y.) EFFECTIVENESS OF ARCHERY IN CONTROLLING DEER ABUNDANCE ON THE HOWLAND ISLAND GAME MANAGEMENT AREA. N. Y. Fish & Game J. 10(2): 186-193, 1 fig. July 1963. WR 112: 33

Abstract: By 1950 deer on the 3.78-square mile Howland Island Game Management Area had become numerous enough to require reduction and control. Various open seasons, both for gunners and for archers, were held. Gunning was the most effective, especially for reducing the initial overpopulation. However, it was found that archery for deer of either sex was reasonably effective in controlling the population after it had been reduced to a satisfactory level. Results indicate that, in an island situation such as the one studied, a satisfactory deer harvest can be achieved by archers if there are between 100 and 200 [archers] per square mile per day and at least half of them are active enough to keep deer on the move.

Severinghaus, C. W., and Stuart Free. (R. D. 2, Voorheesville, N. Y.) MANAGEMENT IMPLICATIONS OF THE TREND AND DISTRIBUTION OF THE LEGAL DEER KILL IN THE ADIRONDACK REGION. N. Y. Fish & Game J. 10(2): 201-214, 3 figs. July 1963. WR 112: 33

Abstract: Data for the distribution of the legal kill of deer by towns in the Adirondack counties for the years 1941, 1954 and 1957 afford a means of evaluating some of the factors limiting abundance. Population levels, as reflected by the number taken per square mile, were consistently lower in the peripheral section of the region than in the central section. Overbrowsing and chronic losses from starvation in the central section are evidence that the carrying capacity of the range has been reached and that sustained increases in abundance cannot be expected. Proper management calls for harvesting does and fawns as well as bucks, especially in the less accessible areas, and improving the winter range. In the peripheral section the range is in good condition generally and starvation is negligible. Substantial increases in abundance are possible if losses among does can be substantially reduced. Illegal hunting is considered to be the chief cause of these losses.

Smith, S. E., R. W. Gardner, and G. A. Swanson. (Cornell Univ., Ithaca, N. Y.) A STUDY OF THE ADEQUACY OF COBALT NUTRITION IN NEW YORK DEER. N. Y. Fish & Game J. 10(2): 225-227. July 1963. WR 112: 33

Conclusion: The vitamin B_{12} concentrations in the livers of 41 deer taken from three major areas in New York State did not differ significantly among each other and were roughly comparable to the levels observed in well-fed domestic ruminants. Even the lowest individual values gave no indication of a dietary deficiency of the element, cobalt.

Teer, James G. TEXAS DEER HERD MANAGEMENT PROBLEMS AND PRINCIPLES. Texas Game & Fish Comm. Bull. no. 44. 69 p., illus. 1963. WR 112: 33

"The purpose of this bulletin is to acquaint the average Texan with problems that arise in managing deer and to present the biological principles that form the foundation of sound management." With the author's chief burden being to persuade hunters of the relationship of food and deer production, this publication carries a message familiar to all deer biologists. There is relatively little textual material, and important points are printed in red. Cartoon illustrations are generously used.

Verme, Louis J. (Mich. Dept. Conserv., Shingleton.) EFFECT OF NUTRITION ON GROWTH OF WHITE-TAILED DEER FAWNS. Trans. 28th N. Am. Wildl. Conf. p. 431-443, 2 figs. 1963. WR 112: 33

Malnutrition in the mother results in retarded length and weight growth of her fetus beginning at about 133 days' gestation. At birth, fawns from nearly starved mothers average about 46% lighter, and they tend to be stunted skeletally, compared to young from well-fed does. In contrast to malnourished deer, properly-fed mothers incur a proportionately greater lactation burden because they have bigger young, suckle more twins, and successfully rear their early-born offspring. Initially tiny fawns experience a faster, or compensatory, rate of growth compared to very large young. Hence, despite the original disparity in weights, because of the coaction of various biological forces, the size gap may be practically non-existent at four weeks old.--From summ.

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MAMMALS--MARINE

Brooks, James W. (Dept. Fish & Game, Juneau, Alaska.) THE MANAGEMENT AND STATUS OF MARINE MAMMALS IN ALASKA. Trans. 28th N. Am. Wildl. Conf. p. 314-326. 1963. WR 112: 34

Status and management reports for sea otter, hair seals, polar bear, Steller sea lion and beluga in Alaska.

Ivanova, E. I. [BODY PROPORTIONS AND GROWTH OF THE FINBACK WHALE (BALAENOPTERA PHYSALUS L.) CAPTURED IN THE KURILE ISLANDS.] Tr. Inst. Morfol. Zhivotnykh Akad. Nauk SSSR 34: 174-194. 1961. [From Biol. Abstr. 43(1), 1963, from Referat. Zhur., Biol., 1962, no. 19I258. Transl. from Russian abstr.] WR 112: 34

Moore, Joseph Curtis. (Chicago Nat. Hist. Museum, Chicago, Ill.) RECOGNIZING CERTAIN SPECIES OF BEAKED WHALES OF THE PACIFIC OCEAN. Am. Midland Nat. 70(2): 396-428, 16 figs. Oct. 1963. WR 112: 34

Rae, B. B. SEALS AND SCOTTISH FISHERIES. Dept. Agr. Fish Scot. Mar. Res. no. 2. 1-39 p. 1960. [From abstr. in J. Animal Ecol. 32(2), 1963.] WR 112: 34

Abstract: Traces events since the passing of the Grey Seals Protection Act 1914 to the present day and offers impartial, overwhelming evidence that the grey seal, in particular, causes great damage to fisheries, in taking nearly all species of marketable fish, with a preference for salmon and trout, in damaging fishing gear and disturbing fish and in furthering the spread of the nematode Porrocaecum decipiens in the flesh of cod. The overall quantity of fish taken by seals equals nearly one-fifth of the total catch in home waters, and this damage is concentrated in Scottish and northern waters where 80% of British seals are aggregated.

Rice, Dale W. (U. S. Fish & Wildl. Serv., Seattle, Wash.) PACIFIC COAST WHALING AND WHALE RESEARCH. Trans. 28th N. Am. Wildl. Conf. p. 327-335, 2 figs. 1963. WR 112: 34

A critical appraisal of the United States Pacific whaling industry and whale research program. "If the...nations whaling in the North Pacific will cooperate in an adequate research program, there is still time to show that we can manage whale stocks on a sustained yield basis."

Sleptsov, M. M. [DISTRIBUTION OF FEEDING AREAS AND WHALES IN THE OKHOTSK SEA.] Tr. Inst. Morfol. Zhivotnykh Akad. Nauk SSSR 34: 79-92. 1961. [From Biol. Abstr. 43(1), 1963, from Referat. Zhur., Biol., 1962, no. 18I361. Transl. from Russian abstr.] WR 112: 34

Abstract: Distribution of feeding areas of whales in the Okhotsk Sea is determined by periodic changes in the hydrological regime--warming or cooling of various regions of the sea. Stocks of whales in the Okhotsk Sea are not utilized fully because of the shore location of whaling bases. In order to exploit stocks of whale species in the Okhotsk Sea it would be well to construct small deep-sea whaling bases of the type of the "Aleut".

Sleptsov, M. M. [DISTRIBUTION OF WHALES IN THE JAPAN SEA.] Tr. Inst. Morfol. Zhivotnykh Akad. Nauk SSSR 34: 93-110. 1961. [From Biol. Abstr. 43 (1), 1963, from Referat. Zhur., Biol., 1962, no. 18I356. Transl. from Russian abstr.] WR 112: 34

Broadening of the distribution of whales is examined in relation to the distribution of changing biomasses of zooplankton and hydrographic conditions in different parts of the Japan Sea. The highest biomass of zooplankton is found in the northern part of the Japan Sea and Tatar strait in summer and autumn, and the southern shores of the sea and off the shores of Korea in winter. The total supply of whales in the Japan Sea is low.--From abstr.

Sleptsov, M. M. [LIVING CONDITIONS FOR WHALES IN THE ZONES OF MIXING OF COLD (KURILE-KAMACHATKA) AND WARM (KUROSHIO) CURRENTS.] Tr. Inst. Morfol. Zhivotnykh Akad. Nauk SSSR 34: 111-135. 1961. [From Biol. Abstr. 43(1), 1963, from Referat. Zhur., Biol., 1962, no. 18I357. Transl. from Russian abstr.] WR 112: 35

In 1951-1956 the distribution of whale species in the northwestern part of the Pacific Ocean was determined by fields of feeding, that is, aggregations of Crustacea, cephalopods, molluscs and schooling fish. Aggregations arise at the junction of cold and warm currents (Oyashio and Kuroshio) where deep waters come to the surface. These "frontal" regions shift in different years and seasons of the year (between 40° and 60°N. Lat.). In order to activate the Soviet whaling industry in the Far East it would be desirable to construct 1-2 floating whaling bases of a capacity of 15,000 metric tons and transfer the industry from shore areas to deep sea areas.--From abstr.

Sleptsov, M. M. [RESULTS OF THE WEIGHING OF LARGE AND SMALL WHALES CAPTURED IN THE FAR EAST.] Tr. Inst. Morfol. Zhivotnykh Akad. Nauk SSSR 34: 144-150. 1961. [From Biol. Abstr. 43(1), 1963, from Referat. Zhur., Biol., 1962, no. 19I260. Transl. from Russian abstr.] WR 112: 35

Sokolov, V. E. [DETERMINATION OF THE SEXUAL CONDITION OF FEMALES OF THE BLACK SEA DOLPHIN (DELPHINUS DELPHIS L.) FROM MORPHOLOGICAL CHANGES IN THEIR SEXUAL SYSTEM.] Nauchn. Dokl. Vysshei Shkoly. Biol. Nauk 1: 38-50. 1962. [From Biol. Abstr. 43(1), 1963, from Referat. Zhur., Biol., 1962, no. 18I364. Transl. from Russian abstr.] WR 112: 35

A summary table is given of measurements of the body, ovaries, and uterus of the females, which were divided into groups of the sexually immature (body length 125-170 cm), sexually mature, non-parous (150-180 cm), pregnant (155-187 cm), and given birth in the present season (160-187 cm).--From abstr.

MAMMALS--OTHER GROUPS

Dimelow, E. J. (Mount Allison Univ., Sackville, New Brunswick, Canada.) THE BEHAVIOUR OF THE HEDGEHOG (ERINACEUS EUROPAEUS L.) IN THE ROUTINE OF LIFE IN CAPTIVITY. Proc. Zool. Soc. London 141(2): 281-289. Sept. 1963. WR 112: 35

Discussion under the following headings: handling, removal of parasites and toilet, nest building and sleep, exercise, relationships between hedgehogs, and wild hedgehogs encountered by the captive ones and their observed movements.

Dimelow, E. J. (Mount Allison Univ., Sackville, New Brunswick, Canada.) OBSERVATIONS ON THE FEEDING OF THE HEDGEHOG (ERINACEUS EUROPAEUS L.). Proc. Zool. Soc. London 141(2): 291-309. Sept. 1963. WR 112: 35

Abstract: The feeding of the hedgehog in captivity is described and the degree to which this seems to be affected by hibernation. Altogether 167 food preference tests were performed by nine hedgehogs and the results seem to indicate that though hedgehogs will eat most of the small invertebrates that they find in their natural habitat, they consistently select some rather than others.

Dunnet, G. M. (Culterty Field Station, Univ. Aberdeen, Newburgh, Aberdeenshire, Scotland.) A POPULATION STUDY OF THE QUOKKA, SETONIX BRACHYURUS QUOY & GAIMARD (MARSUPIALIA). III. THE ESTIMATION OF POPULATION PARAMETERS BY MEANS OF THE RECAPTURE TECHNIQUE. C.S.I.R.O. Wildl. Res. 8(1): 78-117, 7 figs. July 1963. WR 112: 35

Summary: Several methods of trapping, marking, and recapturing quokkas, Setonix brachyurus, were tried, and all except a long-net sampling technique used at the summer drinking places were obviously unsuitable for providing data on which population studies could be based. The long-net method is described in detail and the nature of the sample obtained is discussed from the point of view of randomness. There is evidence of varying risk of capture between and within different age and sex categories. There are also indications

of site avoidance within a trapping period of three consecutive nights, and of continued entry to and departure from the drinking site over the summer months. Under these circumstances the estimates of the total number of animals visiting the drinking site, and of their survival, are subject to a variety of biases. Consideration of the population composition has enabled an approximate life-table for the species to be drawn up. The general conclusion is that, owing largely to variations in natural behaviour, individual animals are not randomly caught, and that the recapture method, even when it is used in an apparently suitable situation such as this, does not provide sufficiently precise estimates of population parameters to justify the very large amount of field-work involved.

O'Donoghue, P. N. (Agr. Res. Council Inst. Animal Physiol., Babraham, Cambridge, England.) REPRODUCTION IN THE FEMALE HYRAX (DENDROHYRAX ARBOREA RUWENZORII). Proc. Zool. Soc. London 141(2): 207-237, 9 figs. + 6 pls. Sept. 1963. WR 112: 36

On reproductive physiology.

BIRDS--GENERAL

Pennie, I. D. A CENTURY OF BIRD-WATCHING IN SUTHERLAND. Scottish Birds 2: 167-192. 1962. [From J. Animal Ecol. 32(2), 1963.] WR 112: 36

"A review of the changes in the status of birds in the county over the past 100 years."

BIRDS--MORPHOLOGY, PHYSIOLOGY, BEHAVIOR, MIGRATION

Bartholomew, George A., and Tom J. Cade. (Univ. Calif., Los Angeles.) THE WATER ECONOMY OF LAND BIRDS. Auk 80(4): 504-539, 6 figs. Oct. 1963. WR 112: 36

A review of research, with suggestions of rich possibilities for further research, on the water economy of land birds. The bibliography contains more than 80 titles.

Dol'nik, V. P. INBORN COMPONENTS OF THE INSTINCTIVE ACTIVITY OF BIRDS DURING THE NESTING PERIOD. 14 p. 1962. [From Tech. Transl. 10(2), 1963. Transl. from Russian of Leningrad Univ. Vestnik USSR 15(21), Ser. Biol. no. 4. p. 101-112. 1960. Available from OTS, Dept. Commerce, Washington, D.C., or SLA, John Crerar Library, 35 West 33rd Street, Chicago, Ill., at $1.60.] WR 112: 36

Abstract: In the course of nest-building and egg-laying the thresholds of two innate reactions--brooding and feeding--are lowered simultaneously. By the end of egg-laying the bird is equally ready to act according to both reactions. The sequence of these reactions depends on the sequence in which the stimuli are formed. In most of the passerines the nest is three times as strong a stimulus of the brooding reaction as the eggs. The eggs are the principal stimulus of birds that build primitive nests. In the course of brooding, brooding itself becomes a dominant. As the process of dominant formation is always accompanied by the process of generalization, brooding can be stimulated by an increasingly imperfect nest complex (empty nest, small balls or ellipsoids instead of eggs, etc.). The dominant is a maximum at the moment of hatching. The sign stimulus of the innated feeding reaction is the nestling's open mouth. The feeding reaction likewise becomes a dominant. Thus, within six to seven days after hatching the adult bird is subjected to two dominants--brooding and feeding. During this period the behavior of the nestlings effects the switching of the two dominants.

Gibb, J. A., and Monica M. Betts. (P. O. Box 466, Lower Hutt, New Zealand.) FOOD AND FOOD SUPPLY OF NESTLING TITS (PARIDAE) IN BRECKLAND PINE. J. Animal Ecol. 32(3): 489-533, 9 figs. Oct. 1963. WR 112: 36

The following are discussed: breeding population, sources of food, density of caterpillars, food of nestlings, size of prey, care of nestlings and feeding frequency, weights of food and nestlings, and predation on certain caterpillars.

Gobeil, Robert E. (Cole Road, Biddleford, Maine.) THE COMPARATIVE FEEDING BEHAVIOR OF WINTERING EVENING GROSBEAKS AND PURPLE FINCHES. Bird-Banding 34 (4): 217-218. Oct. 1963. WR 112: 37

Activity of birds at a feeding station during Feb. and Mar. was greatest from 6:30 to 8:00 a.m. The largest numbers of birds came to the feeder on warm, calm days, with fewer birds on rainy, windy days.

Goodpasture, Katherine A. (Vanderbilt Univ., Nashville, Tenn.) AGE, SEX, AND WING LENGTH OF TOWER CASUALTIES: FALL MIGRATION, 1962. Bird-Banding 34 (4): 191-199, 1 fig. Oct. 1963. WR 112: 37

A report of 316 dead birds of 24 spp. examined during Sept. and Oct.

Hartman, F. A., and M. A. Lessler. (Ohio State Univ., Columbus.) ERYTHROCYTE MEASUREMENTS IN BIRDS. Auk 80(4): 467-473. Oct. 1963. WR 112: 37

Measurements of erythrocytes and their nuclei were made in 124 species of birds in 46 families collected in Panamá and the United States. The range of the erythrocytes extended from 10.7 mu X 6.1 mu in Selaphorus to 15.8 mu X 10.2 mu in Tigrisoma. The lower forms have the largest erythrocytes. In most species the nucleus is more oblong than is the cytosome.--From summ.

Humphrey, Philip S., and Kenneth C. Parkes. (U. S. Natl. Museum, Washington, D.C.) COMMENTS ON THE STUDY OF PLUMAGE SUCCESSION. Auk 80(4): 496-503. Oct. 1963. WR 112: 37

This is a reply to an article by Erwin Streseman [see WR 110: 42] criticizing earlier suggestions by Philip S. Humphrey and Kenneth C. Parkes [see WR 95: 71] relative to proposed changes in terminology for molts and plumages of birds.

Lack, David. (Edward Grey Inst., Oxford, England.) MIGRATION ACROSS THE SOUTHERN NORTH SEA STUDIED BY RADAR. PART 5. MOVEMENTS IN AUGUST, WINTER AND SPRING, AND CONCLUSION. Ibis 105(4): 461-492. Oct. 1963. WR 112: 37

The last in a series of articles. In Aug., the main movements of lapwings were westward and of warblers south-southeastward. Winter movements to westward or southward were initiated primarily by easterly or northerly winds, respectively. Eastward departures in Mar. and Apr. occurred mainly with westerly winds in warm weather. Movements in late Apr. and May occurred mainly with southerly winds, but sometimes against the wind.

Lee, S. L. B. MIGRATION IN THE OUTER HEBRIDES STUDIED BY RADAR. Ibis 105 (4): 493-515, 8 figs. Oct. 1963. WR 112: 37

Arriving migrants flew low during the latter part of the night and could not be detected by radar. These migrants gained altitude at dawn, and drifted continental migrants then changed flight direction from WSW to SSW and SSE. In spring nearly all of the major movements were associated with light following winds. There were 3 main times of autumn departure: nightfall, about 2 hours before sunrise, and at sunrise.

Mayhew, Wilbur W. (Univ. Calif., Riverside.) HOMING OF BANK SWALLOWS AND CLIFF SWALLOWS. Bird-Banding 34(4): 179-190, 1 fig. Oct. 1963. WR 112: 37

Bank and cliff swallows showed no tendency to fly after release at a distance from the colony. Those returning apparently traveled at a leisurely speed. Cliff swallows released at night homed as well as those released in the daytime, and there was no difference in homing ability of males and females. The stage of the breeding cycle also made no difference.--From summ.

McCandless, James B. BIRD LIFE IN SOUTHWESTERN PUERTO RICO. I. FALL MIGRATION. Caribbean J. Sci. 1(1): 3-12. 1961. WR 112: 37

Available data were examined for evidence of the use of the Antilles as stepping stones from Florida to South America, and relatively little evidence was found. Evidence seems to indicate that many birds cross the Gulf of Mexico and the Caribbean in over-water flights.

Meanley, Brooke. (Patuxent Wildl. Res. Center, Laurel, Md.) PRE-NESTING ACTIVITY OF THE PURPLE GALLINULE NEAR SAVANNAH, GEORGIA. Auk 80(4): 545-547, 1 fig. Oct. 1963. WR 112: 38

Arrival and nesting dates were given, and the courtship display was described.

Nisbet, I. C. T. (Univ. Malaya, Kuala Lumpur.) QUANTITATIVE STUDY OF MIGRATION WITH 23-CENTIMETRE RADAR. Ibis 105(4): 435-460, 1 fig. Oct. 1963. WR 112: 38

The density of echoes decreased with distance from the center of the radar screen, being halved about every eight miles. Rate of decrease varied only slightly with total migration density so the total number of birds on the screen could be estimated by counting the echoes around the edge of the screen. When these estimates were compared with estimates made in moon-watching, each echo was found to represent 2-12 birds. It was found that many birds migrate in small groups at night, but the groups are probably spread over a wide area. Estimates of low migration density have an error of about 25%, but error increases with density of migrants so that very high densities cannot be measured.

Nisbet, I. C. T., W. H. Drury, Jr., and J. Baird. WEIGHT-LOSS DURING MIGRATION. Bird-Banding 34(3): 107-159, 2 figs. July 1963. WR 112: 38

Part 1 covered deposition and consumption of fat by the blackpoll warbler. Reported weights of these warblers ranged from 9 to 23 grams, with the heavier birds carrying much fat and the very light birds none. It was suggested that the heavier weights were attained just before departure on an overseas flight, and it was calculated that the heavy birds had ample fuel reserves for flight of 105-115 hours--ample time for a non-stop flight from New England to the mainland of South America. Birds kept overnight in dark cages lost weight at an average rate of 0.062 g/hr. Part 2, prepared by the senior author, covered a review of other estimates. Except for 2 doubtful estimates of rates of weight loss during migration, all published figures lie between 0.56 and 1.3% of total body weight per hour. It is suggested that a reasonable average for the power consumption of migrating passerines is 0.076 Kcal./g total weight/hr.

Nordstrom, Goran. (Zool. Museum, Univ. Helsinki/Helsingfors, Finland.) FINNISCHE WIEDERFUNDE IM AUSLAND BERINGTER VOGEL. [RECOVERIES IN FINLAND OF BIRDS BANDED ELSEWHERE.] Ornis Fennica 39(4): 131-151. 1962. [From Biol. Abstr. 43(3), 1963. (In German).] WR 112: 38

Riddle, Oscar. (Plant City, Fla.) PROLACTIN OR PROGESTERONE AS KEY TO PARENTAL BEHAVIOUR: A REVIEW. Animal Behaviour 11(4): 419-432. Oct. 1963. WR 112: 38

Based chiefly on his research conducted during 1931-1944, Riddle defends his belief that prolactin is the primary hormonal inducer of incubation behavior in the ringed dove against more recent (1955-1961) conclusions of D. S. Lehrman.

Sage, Bryan L. THE INCIDENCE OF ALBINISM AND MELANISM IN BRITISH BIRDS. British Birds 56(11): 409-416. Nov. 1963. WR 112: 38

This study was based on a questionnaire which revealed 3,134 cases of albinism and 113 cases of melanism. The highest incidence of albinism appears among social breeders and sedentary species that tend to form isolated populations. Melanism is much more unusual than albinism.

Smith, W. John. (Museum Comp. Zool., Harvard Univ., Cambridge, Mass.) VOCAL COMMUNICATION OF INFORMATION IN BIRDS. Am. Nat. 97(893): 117-126, illus. 1963. [From Biol. Abstr. 43(3), 1963.] WR 112: 38

Investigations of the display behavior of tyrannid flycatchers suggest that the meaning of a display which is used in different contexts may be different in each context. In the species studied vocalizations seem to be much more important than visible displays, and most of the vocalizations are variable in

a number of aspects. It seems possible that the different modes of variation of a display are capable of modifying considerably the information content of that display.--Author.

Toivari, Lauri, and Ossi Lindqvist. DAILY SINGING RHYTHMICS OF THE MARSH WARBLER (ACROCEPHALUS PALUSTRIS) AND BLYTH'S REED WARBLER (ACROCEPHALUS DUMETORUM). Ornis Fennica 39(4): 151-154. 1962. [From Biol. Abstr. 43(3), 1963.] WR 112: 39

Vince, M. A., and R. P. Warren. (Psychol. Lab., Cambridge, England.) INDIVIDUAL DIFFERENCES IN TASTE DISCRIMINATION IN THE GREAT TIT (PARUS MAJOR). Animal Behaviour 11(4): 548-552, 3 figs. Oct. 1963. WR 112: 39

Summary: Three groups of birds, varying in age, or previous experience were tested in the four different taste modalities, sweet, sour, salt and bitter, by being given the choice between experimentally flavoured solutions and water. Considerable individual variation was found in each modality. On the whole, birds reared in the wild drank relatively more of preferred fluids than did hand-reared birds of the same age. Very young hand-reared birds varied less between individuals than older birds in the wild or hand-reared groups, and their scores were also distributed differently. It is suggested that the results support the view that some, at least, of the individual differences observed are due to experience.

Wagner, H. O. BEZIEHUNGEN ZWISCHEN UMWELTFAKTOREN UND DER BRUTZEIT, ZAHL DER GELEGE SOWIE IHRER GROSSE. [THE RELATION BETWEEN ENVIRONMENTAL FACTORS AND BREEDING TIME, NUMBER OF CLUTCHES AND THEIR SIZE.] Zool. Anz. 164: 161-172. 1960. [From Auk 80(3), 1963. In German.] WR 112: 39

Watson, George E. (U. S. Natl. Museum, Washington, D.C.) THE MECHANISM OF FEATHER REPLACEMENT DURING NATURAL MOLT. Auk 80(4): 486-495, 2 figs. Oct. 1963. WR 112: 39

Old feathers are pushed from their follicles by growth of the new feathers, and the old remain attached to the new until the new become keratinized.

BIRDS--MANUALS, FAUNAS, COMMUNITIES

Banks, Richard C. (Nat. Hist. Museum, San Diego, Calif.) BIRDS OF THE BELVEDERE EXPEDITION TO THE GULF OF CALIFORNIA. Trans. San Diego Soc. Nat. Hist. 13(3): 51-60. June 1963. WR 112: 39

Notes on the 67 spp. of birds observed during a 1962 expedition.

Grant, Martin L. (State Coll. Iowa, Cedar Falls.) A CHECKLIST OF IOWA BIRDS, CODED WITH STATUS SYMBOLS. Iowa Bird Life 33(3): 50-62. Sept. 1963. WR 112: 39

A total of 361 species is listed, and 24 symbols are used to indicate the status of species.

Hayward, C. Lynn, Merlin L. Killpack, and Gerald L. Richards. (Brigham Young Univ., Provo, Utah.) BIRDS OF THE NEVADA TEST SITE. Brigham Young Univ. Sci. Bull., Biol. Ser. 3(1): 1-27, 2 figs. June 1963. WR 112: 39

Reports observations on 192 spp. of birds, of which 6 appear to be new records for Nevada.

Hines, John Q. (Dorris, Calif.) BIRDS OF THE NOATAK RIVER, ALASKA. Condor 65(5): 410-425, 5 figs. Sept. 1963. WR 112: 39

Birds were grouped according to occupied habitat, and annotations were given on the relative abundance of populations of 80 spp.

Marchant, S. (36 Arthur Circle, Forrest, Canberra, Australia.) THE BREEDING OF SOME IRAQI BIRDS. Ibis 105(4): 516-557. Oct. 1963. WR 112: 39

The breeding status and biology of 36 spp. of birds in Iraq are discussed in more or less detail, depending on the data available for the various species.

Messersmith, Donald H. (Radford Coll., Radford, Va.) BIRDS IN A RED PINE PLANTATION. Wilson Bull. 75(3): 235-243, 2 figs. Sept. 1963. WR 112: 40

A red pine plantation in northern Mich. was surveyed for birds' nests. This 11-year-old plantation yielded 100 nests of 11 species; chipping sparrows and cedar waxwings were the most abundant. These birds preferred parts of the tract where the trees were about 3 meters high and relatively open. Nine other species were noted feeding in the plantation. The only known predator was a red squirrel, which probably destroyed some eggs.--From summ.

Nero, Robert W. BIRDS OF THE LAKE ATHABASCA REGION, SASKATCHEWAN. Saskatchewan Nat. Hist. Soc., Spec. Publ. no. 5. 143 p., illus. June 1963. $2.00. WR 112: 40

This report is based on the author's field work in parts of 3 summers (1960, 1961, 1962), on unpublished records of other observers, and on records gleaned from earlier published reports. Local status of 82 spp. is discussed, with 77 spp. being reported as nesting and 15 spp. on the hypothetical list. Most of the 28 photographs show views of habitats.

Ouellet, Henri, and Réginald Ouellet. (Natl. Museum Canada, Ottawa, Ontario.) BIRD NOTES FROM LAC STE. ANNE, SAGUENAY COUNTY, QUEBEC. Canadian Field-Nat. 77(3): 146-153. July-Sept. 1963. WR 112: 40

An annotated list of the 108 spp. observed during 1959.

Pikula, J. [THE NUMBER OF BIRDS IN DECIDUOUS AND CONIFEROUS FORESTS NEAR BRNO IN WINTER.] Zool. Listy (Brno) 12(2): 107-114. 1963. [From Commonwealth Forestry Bur., Centralized Title Serv. Cards, 9 Sept. 1963. In Czech with German summ.] WR 112: 40

Stupka, Arthur. NOTES ON THE BIRDS OF GREAT SMOKY MOUNTAINS NATIONAL PARK. Univ. Tenn. Press. [ix] + 242 p. 1963. $3.00, paper. WR 112: 40

This is a compilation of observations on the more than 200 spp. of birds found in Great Smoky Mountains National Park in the past 25 years. Migration dates, unusual occurrences and general observations are given in narrative form.

Yocom, Charles F. (Humboldt State Coll., Arcata, Calif.) BIRDS OF THE TETLIN LAKE-TOK JUNCTION-NORTHWAY AREA, ALASKA. Murrelet 44(1): 1-6, 1 fig. Jan.-Apr. 1963. WR 112: 40

Observations are reported on 66 spp. noted by the author in July 1962.

BIRDS--POPULATIONS & FLUCTUATIONS

Brewer, Richard. (Western Mich. Univ., Kalamazoo.) STABILITY IN BIRD POPULATIONS. Occas. Papers Adams Center Ecol. Studies no. 7. 12 p. 31 May 1963. WR 112: 40

Bird populations were most stable in the hydric forest and least stable in the xeric forest.

Brown, L. H. OBSERVATIONS ON EAST AFRICAN BIRDS OF PREY. East African Wildl. J. 1: 5-17, illus. Aug. 1963. WR 112: 40

Observations were made during a period of 13 years on a population of at least 9 pairs of 9 spp. of birds of prey in an area of 4.2 square miles. It was concluded that the observed concentration of large raptors was due to interspecific gregariousness. Information available to the author suggested that mammal populations were not limited by avian predation.

Graber, Richard R., and Jean W. Graber. (Ill. Nat. Hist. Surv., Urbana.) A COMPARATIVE STUDY OF BIRD POPULATIONS IN ILLINOIS, 1906-1909 AND 1956-1958. Ill. Nat. Hist. Surv. Bull. 28(3). vi + p. 383-528, 32 figs. Oct. 1963. $1.00. WR 112: 41

A report on Illinois bird populations as determined by the strip-census method in two periods separated by about a half century. The population of each important species is given in relation to all important habitats and the time of year. It was estimated that 7,662 acres were covered in the earlier period and 6,785 in the later period, with the various habitats being covered at random. Using the accumulated data, calculations were made of the total populations of the various species in Ill. The winter bird population of Ill. was estimated at 30,000,000 in 1907 and 55,000,000 in 1957: the summer population was estimated at 56,949,000 birds in 1909 and 49,464,000 in 1957. It was further estimated that there may have been 97,000,000 birds in Ill. in 1800. There has been relatively little change during the past 50 years in the total number of birds in Ill., but there has been a trend for a larger portion of the population to be made up of fewer species.

Riecke, F. [FIVE YEARS OF BIRD PROTECTION IN THE BERLIN FORESTS.] Anz. Schädlingsk. 36(7): 106-110. 1963. [From Commonwealth Forestry Bur., Centralized Title Serv. Cards, 9 Sept. 1963. In German with English summ.] WR 112: 41

A brief report on the installation of nesting boxes (now numbering 0.52/ha.) and their utilization; 80-90% of the boxes had yearly broods, save in 1956. Closed boxes were preferred to half-open ones.--Courtesy/ Frank M. Johnson.

BIRDS--ECONOMICS, CONTROL, MORTALITY

Arthur, R. W. BIRDS KILLED AT BARDSEY LIGHT--1960. Bardsey Observatory Rept. no. 8. p. 35-37. 1961. [From J. Animal Ecol. 31(2), 1962.] WR 112: 41

Analysis of 395 birds killed at this lighthouse (off the Welsh coast) well known for its high bird mortality.

Koehler, James W. (Calif. Dept. Agr., 1220 N St., Sacramento.) HOW TO CONTROL SOME OFF BEAT BIRDS / LINNETS, HORNED LARKS, CROWNED SPARROWS, WOODPECKERS. Pest Control 31(9): 35-36, 50. Sept. 1963. WR 112: 41

The County Agricultural Commissioners of Calif. may legally kill or cause to be killed linnets, horned larks, crowned sparrows and woodpeckers when killing is necessary to protect agricultural and horticultural crops. "When practical and economical deterrent or repellent methods are known, the ranchers are instructed in the use of such to the total exclusion of any destruction or killing methods." Food poisoning is described for the control of linnets, food poisoning and "continuous string flagging" for control of horned lark depredations, food poisoning and habitat manipulation for crowned sparrows and systematic shooting for woodpeckers. Linnets are inimical to man's interests in attacking ripening fruit, flower and vegetable seed crops and in disbudding fruit trees; horned larks and crowned sparrows are inimical in destruction of garden and truck crops; woodpeckers frequently do serious damage in nut orchards.

MacDonald, J. W. (Ministry Agr., Fisheries & Food, Lasswade, Midlothian, Scotland.) MORTALITY IN WILD BIRDS. Bird Study 10(2): 91-108. June 1963. WR 112: 41

Two hundred and six birds of 59 species were examined to determine the causes of death. The diagnosed causes were as follows: poisoning, 45%; adverse environmental factors, 19%; injury, 13%; parasitism, 9%; infection, 8%. The remaining 6% were decomposed and unsuitable for examination.--From summ.

Shuyler, Harlan R. (NICE Pest Control Serv., Kansas City, Kans.) BIRD CONTROL IN KANSAS CITY. Pest Control 31(9): 9-10, 12, 14, illus. Sept. 1963. WR 112: 42

Pigeons, house sparrows and starlings were controlled in a 69-block area of Kansas City, Mo., through the use of combinations of contact and food poisons and trapping. After about 6 months of control activities, all of the major flocks and most of the smaller flocks of pest birds were controlled. Infestation by pigeons resumed, but "it would take nearly 2 years for the population to again reach the levels present before control services began." Starlings quickly repopulated the area, but there was little repopulation by house sparrows.

Weston, Henry G., Jr. (San Jose State Coll., San Jose 14, Calif.) DEAD FISH AS A SOURCE OF FOOD FOR VARIOUS BIRDS. Auk 80(4): 550-551. Oct. 1963. WR 112: 42

Eleven species of birds were observed eating dead fish along the shore of a small Iowa lake following a late March snowfall.

BIRDS--PARASITES AND DISEASES

Gusev, V. M., A. A. Guseva, and others. [THE ROLE OF BIRDS IN THE TRANSFER OF TICKS AND FLEAS. MATERIALS COLLECTED IN THE AZERBAYJAN SSR.] Zool. Zhur. 41: 905-912. 1962. [From Auk 80(3), 1963. In Russian with English summary.] WR 112: 42

The important role of birds in the transportation, distribution and dispersal of these ectoparasites (only a few specific to birds) over the country and other parts of Asia, mainly during the migration, is stressed. The materials are tabulated according to parasite and bird species and seasons.

Huang, Sheng-I. [HELMINTHS OF GAME BIRDS OF THE LOWER AMUR RIVER.] Tr. Gel'mintol. Lab. 12: 284-316, illus. 1962. [From Biol. Abstr. 43(1), 1963. (In Russian).] WR 112: 42

Examinations of 563 birds of the orders Galliformes, Columbiformes, Charadriiformes, and Anseriformes disclosed 182 spp. of helminths: 69 spp. of trematodes, 65 spp. of cestodes, 42 spp. of nematodes, and 6 spp. of acanthocephalans. Of the 177 species of helminths, 72.3% were found in one order of birds, 14.2% in 2 orders, and 13.5% in 3 orders.--A. Fast.

Thompson, G. B. THE PARASITES OF BRITISH BIRDS AND MAMMALS. XXXV. THE ECTOPARASITES OF THE SWALLOW (HIRUNDO RUSTICA RUSTICA L.). Entomol. Mon. Mag. 97: 79-83. 1961. [From J. Animal Ecol. 31(2), 1962.] WR 112: 42

Turemuratov, A. T. [HELMINTHS OF THE ARDEIDAE AND LARI OF THE AMU-DARYA RIVER DELTA.] Tr. Gel'mintol. Lab. 12: 263-277. 1962. [From Biol. Abstr. 43 (1), 1963. (In Russian).] WR 112: 42

Examination of 189 specimens of 12 spp. of fish-eating birds showed the presence of 46 spp. of helminths of 18 families. They included 23 spp. of trematodes, 7 spp. of cestodes, 2 spp. of acanthocephalans, and 14 spp. of nematodes.

White, Clayton M. (Univ. Utah, Salt Lake City.) BOTULISM AND MYIASIS AS MORTALITY FACTORS IN FALCONS. Condor 65(5): 442-443. Sept. 1963. WR 112: 42

Twenty-seven sick peregrine falcons found since 1930 were thought to have been afflicted with botulism. The suspected cause of death of 26 young birds found dead in 9 nests was myiasis.

GAME BIRDS--GENERAL

Calkins, Frank James. A SURVEY OF PROBLEMS RESULTING FROM UPLAND BIRD HUNTING ON UTAH AND BOX ELDER COUNTY, UTAH, FARMS. M.S. thesis, Utah State Univ. 63 p. 1963. WR 112: 42

Eng, Robert L. (Mont. Game & Fish Dept., Helena.) ARE WE GETTING AN ADEQUATE HARVEST FROM OUR GAME BIRDS. Proc. 42nd Ann. Conf. W. Assoc. State Game & Fish Comms. p. 125-126. 1962 [1963]. WR 112: 43

There is general underharvest of most species of upland game birds in Mont., but longer open seasons and more liberal bag limits in recent years have resulted in increased recreational opportunity and reduced waste of game.

Johnson, Robert A. (Ind. Univ., Bloomington.) HABITAT PREFERENCE AND BEHAVIOR OF BREEDING JUNGLE FOWL IN CENTRAL WESTERN THAILAND. Wilson Bull. 75 (3): 270-272. Sept. 1963. WR 112: 43

Some of the older cocks formed harems of 3-5 hens. The location of these harems was advertised by the crowing of cocks from before daylight until dark. Males not attached to harems remained quietly near territories occupied by harems. Crowing was used by author for following movements of birds and for censusing the birds and by natives for locating the birds to be taken in snares. Building of roads is increasing, and it seems unlikely that present populations of jungle fowl can endure.

QUAIL

Nish, Darrel H. QUAIL QUERY. Utah Fish & Game 19(12): 8-11, illus. Dec. 1963. WR 112: 43

Water devices in arid sections of southwestern U. S. have been much used by quail, and it is believed that water is the key to quail abundance. It is not known whether watering devices increase quail populations or merely concentrate them. New research is being directed at the following problems: determining effects of water developments on quail populations, testing census methods, evaluation of habitat and compilation of life history information.

Robeson, Stacy B. (N. Y. State Conserv. Dept., Albany.) SOME NOTES ON THE SUMMER WHISTLING OF MALE BOBWHITE QUAIL. N. Y. Fish & Game J. 10(2): 228. July 1963. WR 112: 43

Observations were given indicating differences in whistling intensity and in response to whistled imitations of mated and unmated cocks and that the covey call of hens was more often heard when there were more hens than cocks in the population.

Robinson, Thane S. (Western Mich. Univ., Kalamazoo.) ILLUMINATION PREFERENDA OF BOBWHITES. Occas. Papers Adams Center Ecol. Studies no. 8. 10 p., 3 figs. 31 May 1963. WR 112: 43

Bobwhites have a light tolerance limit within the range of 1000-2000 foot candles, and habitat selection is based primarily on light tolerance. Bobwhites may be considered to be crepuscular.

Stempel, M. E. (Iowa Conserv. Comm., Des Moines.) BOBWHITE QUAIL, WINTER WEATHER AND AGRICULTURE. Proc. Iowa Acad. Sci. 69: 259-265. 1962. WR 112: 43

Abstract: Bobwhite quail are still found in most of their historic range which extends north into Minnesota. The best Iowa populations are in the three southern tiers of Iowa counties. Their peak abundance occurred before 1900. Long cold winters and deep snows usually decrease quail numbers. However, in the best brushy cover near grain fields, they have persisted in good numbers even through the bitter cold winters of 1912, 1936 and 1960. The 1960 winter losses were estimated at about 70% in scanty cover, but as low as 10% in high quality cover.

Sutton, George Miksch. (Univ. Okla., Norman.) INTERBREEDING IN THE WILD OF THE BOB-WHITE (COLINUS VIRGINIANUS) AND SCALED QUAIL (CALLIPEPLA SQUAMATA) IN STONEWALL COUNTY, NORTHWESTERN TEXAS. Southwestern Nat. 8(2): 108-111, 2 figs. 31 July 1963. WR 112: 43

QUAIL--Continued

Williams, G. R. (Univ. Canterbury, New Zealand.) A FOUR-YEAR POPULATION CYCLE IN CALIFORNIA QUAIL, LOPHORTYX CALIFORNICUS (SHAW) IN THE SOUTH ISLAND OF NEW ZEALAND. J. Animal Ecol. 32(3): 441-459, 3 figs. Oct. 1963. WR 112: 44

A regular population cycle is reported for the first time from the Southern Hemisphere: California quail, Lophortyx californicus (Shaw), populations in Central Otago, South Island, New Zealand, have fluctuated with a clearly regular periodicity of 4 years between 1948 and 1961 inclusive, with peaks and lows separated by an interval of 2 years.--From summ.

PHEASANTS

Christensen, Roger. A SHORT HISTORY OF "JOHN RINGNECK". S. Dak. Conserv. Digest 30(5): 12-14, illus. Sept.-Oct. 1963. WR 112: 44

The first successful stocking of ring-necked pheasants in S. Dak. was made in 1908. During 1911-1919 releases totalled 8,156 pheasants at a cost of less than $20,000. The first open season was held in 1919, and wardens estimated less than 200 birds were killed. The average annual legal bag for the 12 years before 1962 was 1.5 million and an estimated 63 million pheasants were bagged in S. Dak. during 1919-1962. The population reached a peak in 1944 when there was estimated to be 16 million birds in S. Dak.

Dahlgren, Robert B. (S. Dak. Dept. Game, Fish & Parks, Huron.) RHYTHMIC FLUCTUATIONS IN SOUTH DAKOTA PHEASANT POPULATIONS AND ASSOCIATED ADULT MORTALITY, 1947-62. Trans. 28th N. Am. Wildl. Conf. p. 284-297, 3 figs. 1963. WR 112: 44

During the period 1947-62, pheasant populations in S. Dak., N. Dak., Nebr., Minn., and Iowa showed cyclic trends with a relatively low level every third year. Adult mortality was relatively high during years of low population levels, and survival was highest generally in the year following the low. Most mortality occurred in the period from spring to summer, and least mortality occurred in the period from fall to spring.

Westerskov, Kaj. (Wildl. Div., Dept. Internal Affairs, Wellington, New Zealand.) EVALUATION OF PHEASANT LIBERATIONS IN NEW ZEALAND BASED ON A 12-YEAR BANDING STUDY. New Zealand Dept. Internal Affairs Wildl. Publ. no. 71. 68 p., 6 figs. 1963. WR 112: 44

Of 20,417 game farm cock pheasants and 11,034 hens, 5.7% and 1.3%, respectively, were recovered. Releases before the shooting season yielded slightly higher recovery rates (6.4%) than release during (4.6%) or after (4.4%) the shooting season. Of 3,794 cocks "hardened" before release, 19.9% were recovered. Hardening consisted of releasing the birds on Mokoia Island when 7-8 weeks old and trapping them in Mar. and Apr. for release elsewhere. From 0.5-0.33 of the chicks died in the hardening process. In addition to the banding studies, pheasant kills were compared on an area being stocked and an area having only natural reproduction of pheasants. There was little difference in the pheasant kills for the two areas.

GROUSE, PARTRIDGE, ETC.

Aldrich, John W. (Bur. Sport Fisheries & Wildl., Washington, D.C.) GEOGRAPHIC ORIENTATION OF AMERICAN TETRAONIDAE. J. Wildl. Mgmt. 27(4): 529-545, 14 figs. Oct. 1963. WR 112: 44

Abstract: Differentiation of both species and genera within the grouse family (Tetraonidae) has been pronounced in North America. Each of its species has become adapted to specific types of habitat. These vary greatly, from arctic tundra to northern desert scrub and humid forest of both deciduous and coniferous types. All the species are racially variable in some degree, from the sage grouse (Centrocercus urophasianus), with 2 races, to the ruffed grouse (Bonasa umbellus), with 13. The races tend to be correlated with the ecological climax area in which they live. There are a few cases in which

this correlation is not obvious and racial variation seems to be entirely the result of geographical isolation. The present status of grouse depends chiefly on the extent to which modification of required habitat has taken place; the greatest changes have occurred in the grasslands and the least in the arctic-alpine areas.

Allison, Donald G. (N. H. Fish & Game Dept., Concord.) BASIC FEATURES OF THE NEW HAMPSHIRE RUFFED GROUSE CENSUS. J. Wildl. Mgmt. 27(4): 614-616. Oct. 1963. WR 112: 45

Abstract: A summer census of New Hampshire ruffed grouse (Bonasa umbellus) has been taken annually since 1949 by an accurate and relatively inexpensive method. Biologists cover on foot routes in seven regions characterized by different types of habitat. Routes are covered twice a year, once during the first half of summer and once during the second half, to take mortality into account. Results are being used to determine the causes of regional fluctuations in the state's ruffed grouse population.

Ammann, G. A. (Mich. Dept. Conserv., Lansing.) STATUS AND MANAGEMENT OF SHARP-TAILED GROUSE IN MICHIGAN. J. Wildl. Mgmt. 27(4): 802-809, 1 fig. Oct. 1963. WR 112: 45

Abstract: Sharp-tailed grouse (Pedioecetes phasianellus) have decreased at least 9 percent in the Upper Peninsula of Michigan since 1956, largely a reflection of the loss in habitat. In the Lower Peninsula, sharptails are more abundant and somewhat more widespread in distribution than they were in 1956. From population trends correlated with open and closed hunting seasons on intensive study areas, it is judged feasible to replenish depleted spring breeding populations by prohibiting hunting on such areas. Positive management measures on sharptails totaled 6,953 acres purposely burned and 10,849 acres sprayed with herbicide. Spraying or a combination of burning and spraying, where feasible, is the most practical measure for controlling woody cover. Sixteen-, 17-, and 18-year histories of sharptail populations on several areas that were repeatedly treated by burning and spraying showed varying responses by the sharptails but proved that sharptail populations can at least be maintained by intensive management--at a price. In the future, sharptails will very likely be restricted to a few productive and intensively managed areas.

Ammann, G. A. (Mich. Dept. Conserv., Lansing.) STATUS OF SPRUCE GROUSE IN MICHIGAN. J. Wildl. Mgmt. 27(4): 591-593. Oct. 1963. WR 112: 45

The spruce grouse was once common in Michigan but became considerably reduced in numbers before 1912. The last hunting season was in 1914. Birds are now sparsely scattered over most of the Upper Peninsula and in several northern counties of the Lower Peninsula. There appears to have been little change in the population during the last 20-30 years.

Ammann, G. A., and L. A. Ryel. (Mich. Dept. Conserv., Lansing.) EXTENSIVE METHODS OF INVENTORYING RUFFED GROUSE IN MICHIGAN. J. Wildl. Mgmt. 27(4): 617-633. Oct. 1963. WR 112: 45

We recommend the following minimum plan for inventorying ruffed grouse populations under Michigan or similar conditions: (1) spring mail-carrier counts, (2) June and July brood counts by Conservation Department and U. S. Forest Service personnel, or a late June or early July mail-carrier count of all grouse observed, (3) cooperators' hunting reports, and (4) hunting-kill estimates (from mail survey).--From auth. abstr.

Berger, Daniel D., Frances Hamerstrom, and F. N. Hamerstrom, Jr. (Cedar Grove Ornithol. Sta., Cedar Grove, Wis.) THE EFFECT OF RAPTORS ON PRAIRIE CHICKENS ON BOOMING GROUNDS. J. Wildl. Mgmt. 27(4): 778-791. Oct. 1963. WR 112: 45

Abstract: With the help of several thousand cooperators, 4,745 blind-mornings have been spent in watching prairie chickens (Tympanuchus cupido pinnatus) on their booming grounds on two study areas in central Wisconsin

during 21 springs. About 400 additional man-mornings have been spent in making counts and observations from a greater distance. A total of 1,379 encounters between prairie chickens and raptors were seen on booming grounds, in the course of which only three prairie chicken cocks were known to have been killed. Circumstantial evidence indicated the deaths of five more cocks and one bird of unknown sex, and at least three of these were probably killed by raptors. Two more cocks may have been killed in pursuits which ended out of sight of the watchers. We conclude that prairie chickens on their booming grounds are seldom taken by raptors, despite their exposed and seemingly vulnerable position. In 21 springs, we have seen no single instance in which raptor control was advisable.

Bergerud, Arthur T., Stuart S. Peters, and Raymond McGrath. (Dept. Mines, Agr. & Resources, St. Johns, Newfoundland, Canada.) DETERMINING SEX AND AGE OF WILLOW PTARMIGAN IN NEWFOUNDLAND. J. Wildl. Mgmt. 27(4): 700-711, 10 figs. Oct. 1963. WR 112: 46

Abstract: By repeated captures of known-age broods of willow ptarmigan (Lagopus lagopus alleni), wing and weight growth curves were constructed and used to age birds 1-60 days of age. For birds with complete primary development, we set up and tested three hypotheses concerning age determination by examination of external characteristics: (1) the tip of primary 10 is more rounded in adults than in juveniles, (2) adults show little or no difference in the amount of gloss on the three outer primaries, whereas juveniles have more gloss on primary 8 than on 9 or 10, and (3) adults have the same amount of black pigment on primaries 8 and 9 or more on 8 than on 9, whereas juveniles have more on primary 9 than on 8. Hypotheses 2 and 3 were proved reliable when their application determined correctly the ages of 98 percent of the birds handled (n = 780). Hypothesis 1 was not accurate enough for aging purposes. We set up and tested four hypotheses to determine whether external differences could be used to distinguish males from females: (1) females have significantly shorter wings than males, (2) females have significantly shorter rectrices than males, (3) females have brown pigment on their tails, males black, and (4) females can be distinguished from males by the regression of wing length on rectrix length. Using the criteria in these four hypotheses separately, technicians sexed correctly the following percentages of birds: (1) 91 percent (n = 262), (2) 94 percent (n = 273), (3) 89 percent (n = 181), (4) 97 percent (n = 199).

Boag, D. A. (Wash. State Univ., Pullman.) SIGNIFICANCE OF LOCATION, YEAR, SEX, AND AGE TO THE AUTUMN DIET OF BLUE GROUSE. J. Wildl. Mgmt. 27(4): 555-562. Oct. 1963. WR 112: 46

Abstract: Analyses of the contents of 775 crops taken from blue grouse (Dendragapus obscurus) during September and October of 1958-61, inclusive, in north-central Washington are presented for statistical comparisons. Based on the eight foods which appeared with greatest frequency and volume, these comparisons showed that autumn diets of this grouse varied significantly with (1) location, (2) year taken, and (3) age category. It is suggested that preference may largely determine the food of these grouse and that the resulting diet may have a bearing on reproductive performance.

Brander, T. [THE FEEDING UPON PINE NEEDLES BY CAPERCAILLIE TETRAO UROGALLUS.] Lounais-Hameen Luonto (Forssa) 13: 104-105. 1962. [From Auk 80 (3), 1963. In Finnish with German summary.] WR 112: 46

Capercaillie feed upon pine needles of treetops and on young plants in autumn and winter. Some plants were severely injured and the injury has mistakenly been ascribed to moose.

Bump, Gardiner. (Bur. Sport Fisheries & Wildl., Washington, D.C.) HISTORY AND ANALYSIS OF TETRAONID INTRODUCTIONS INTO NORTH AMERICA. J. Wildl. Mgmt. 27(4): 855-867, 2 figs. Oct. 1963. WR 112: 46

Twelve unsuccessful releases of capercaillie (Tetrao urogallus) and 10 of black grouse (Lyrurus tetrix) were made in U. S. during 1883-1950. These

releases were largely based on no scientific study. In this paper the importance of considering source of stock, number of individuals released, physical condition of birds, and year of release in relation to cyclic abundance of grouse are discussed. Descriptions are given of habitat characteristics, food preferences, and climatic conditions in the natural ranges of the capercaillie and black grouse. More than 40 references are cited.

Choate, Thomas S. (Mont. State Univ., Missoula.) HABITAT AND POPULATION DYNAMICS OF WHITE-TAILED PTARMIGAN IN MONTANA. J. Wildl. Mgmt. 27(4): 684-699, 4 figs. Oct. 1963. WR 112: 47

Abstract: The ecology and structure of a population of white-tailed ptarmigan (Lagopus leucurus leucurus), residing during the summer near Logan Pass, Glacier National Park, were studied from early June to mid-September, 1959-62. Although ptarmigan were observed in a wide variety of habitats within the alpine zone, they showed a preference for areas having moderate rock cover, plentiful snow or water, and short, young vegetation. During the breeding season, 21 males and 14 females used the study area (7.08 acres of ptarmigan habitat). Territorial males returned to the same sites year after year and occasionally had the same mates. Yearling males rarely established and mated in their first year, but yearling females bred successfully. Females occasionally returned to the same breeding areas. Few females born on the study area returned to it, but many males did. Clutch size averaged 5.2 eggs (range 3-9). Nest parasitism was rare. Renesting occurred occasionally in phenologically early years. The percent of successful females varied from 35 to 82. Poor success was often caused by inclement weather. Hatching success was 85.5 percent. Brood size at flight age ranged from 3.25 to 3.47. Despite a large variation in natality, the size of the adult population at Logan Pass varied little. Average adult annual mortality was 29 percent, lower than that reported for other galliform species. Chick mortality was 35-44 percent by the time of dispersal. Mortality of immature birds was 63 percent by the following spring. A life table based on these average mortalities indicates a maximum life-length of 15 years, a mean longevity of 3.02 years, and an annual mortality rate of 42.1 percent. The Logan Pass population did not show the fluctuation in numbers reported for other species of ptarmigan and suggested for the tundra biome.

Christensen, Glen C. (P. O. Box 8096, Reno, Nev.) THE IMPERIAL SAND-GROUSE IN THE THAR DESERT OF INDIA. Biol. Soc. Nev., Occas. Paper no. 2. 7 p. + 2 figs. Aug. 1963. WR 112: 47

This paper deals with a description of the winter habitat, distribution, food habits, watering habits and hunting of the imperial sand grouse in the Thar Desert, Rajasthan, India.--Author.

Crichton, V. (Ontario Dept. Lands & Forests, Chapleau, Canada.) AUTUMN AND WINTER FOODS OF THE SPRUCE GROUSE IN CENTRAL ONTARIO. J. Wildl. Mgmt. 27(4): 597. Oct. 1963. WR 112: 47

Before snowfall food consisted chiefly of jackpine (Pinus banksiana), tamarack (Larix laricina) and blueberry (Vaccinium angustifolium) leaves. After snowfall food consisted almost entirely of jackpine leaves.

Crunden, Charles W. (Nev. Fish & Game Dept., Elko.) AGE AND SEX OF SAGE GROUSE FROM WINGS. J. Wildl. Mgmt. 27(4): 846-850, 1 fig. Oct. 1963. WR 112: 47

Abstract: A technique is described for determining age and sex of sage grouse (Centrocercus urophasianus) from wings collected during August and September hunting seasons. Easily discernible primary molt characteristics (retention of primaries 1 and 2 in juveniles and the difference in length of primaries 2 and 3 between adults and juveniles when primary 3 has not yet molted) have been combined with four basic wing measurements in an age and sex key. The relatively slow method of measuring primaries with a ruler is replaced by a measuring board with a backstop and three lines scribed across its face for use with the age and sex key. Wings are measured in a flat and

straightened position from the skin-covered wrist joint to the tip of the desired primary and compared to the appropriate lines on the measuring board. Statistics estimating the probability of misclassification for each of the four measurement categories are given.

Dalke, Paul D., Duane B. Pyrah, Don C. Stanton, John E. Crawford, and Edward F. Schlatterer. (Univ. Idaho, Moscow.) ECOLOGY, PRODUCTIVITY, AND MANAGEMENT OF SAGE GROUSE IN IDAHO. J. Wildl. Mgmt. 27(4): 811-841, 15 figs. Oct. 1963. WR 112: 48

Abstract: A study of the seasonal movements, productivity, and management of sage grouse (Centrocercus urophasianus) was undertaken by the Idaho Cooperative Wildlife Research Unit from August, 1952, to May, 1960, on an area in Fremont and Clark counties in Idaho, Directly west of Yellowstone National Park. Nineteen individual strutting grounds 1/10-10 acres in size were located along 12 miles of the Red Road. Summer brood range was found to be 13-27 miles north and northeast of the Red Road strutting grounds. Flocks of sage grouse began migrating west and southwest in October and November and traveled 30-50 miles, depending upon the depth of the snow. Winter concentrations were usually found where snow was less than 6 inches deep. Dispersal and return east and northeast to the breeding grounds began in late winter for a yearly round trip of 50-100 miles. The number of adult males increased quickly on strutting grounds, and the peak of breeding occurred April 7-21. Strutting grounds were abandoned early in May if there was a high ratio of adults to subadults. A late season peak of subadult-males was often seen on strutting grounds after all other grouse had departed. Interstrutting movements of adult males varied from 22 to 53 percent and up to 4.3 miles from original banding sites. Sexing criteria included plumage differences on chin, throat, breast, undertail coverts, and minor marginal tectrices: size of feet: wing length and length of primaries: weights of adults. Identification of gonads provided the only ready internal diagnostic characteristics of sex. Aging criteria included measurement of bursa, and characteristics of outer two primaries, second primary covert, undertail coverts, and sternum. The mandible test is not reliable for adult sage grouse. The high counts of males on strutting grounds has provided a reasonably accurate method of determining breeding population trends. The method may be as much as 20 percent conservative because of cocks which are not on strutting grounds. The reproductive potential cannot be fully assessed without knowledge of the relative proportion of adult to subadult females. Ovulated-follicle counts as a measure of the number of eggs laid are unreliable, but are useful in determining the relative laying effort between yearlings and adult females. Adverse weather during hatching appreciably lowered number of grouse available for fall hunting. Brood census on summer range is useful in determining reproductive success and is reliable until the third week in July, when brood structure begins to deteriorate.

Dorney, Robert S. (Univ. Wis. Center, Green Bay.) SEX AND AGE STRUCTURE OF WISCONSIN RUFFED GROUSE POPULATIONS. J. Wildl. Mgmt. 27(4): 599-603, 1 fig. Oct. 1963. WR 112: 48

Age and sex ratios differed markedly in different parts of the state. Lack of population homogeneity could produce differing population fluctuations, and hunting regulations should be adjusted to differences in juvenile recruitments. --From abstr.

Eng, Robert L. (Mont. Fish & Game Dept., Helena.) OBSERVATIONS ON THE BREEDING BIOLOGY OF MALE SAGE GROUSE. J. Wildl. Mgmt. 27(4): 841-846, 1 fig. Oct. 1963. WR 112: 48

Subadult males appear on the strutting grounds after, and cease strutting before, adult males, and there are differences in testis development which correspond with this behavioral difference. Infertility of late clutches suggest that a limitation to renesting is imposed by the male.--From abstr.

Fay, L. Dale. (Mich. Dept. Conserv., East Lansing.) RECENT SUCCESS IN RAISING RUFFED GROUSE IN CAPTIVITY. J. Wildl. Mgmt. 27(4): 642-647, 2 figs. Oct. 1963. WR 112: 49

Ruffed grouse were reared to age 5-9 weeks after being incubator-hatched from wild-collected eggs. Hatching success was 77% and survival of hatched chicks 76%. The incubation and rearing conditions were described.

Hale, James B., and Robert S. Dorney. (Wis. Conserv. Dept., Madison.) SEASONAL MOVEMENTS OF RUFFED GROUSE IN WISCONSIN. J. Wildl. Mgmt. 27(4): 648-656. Oct. 1963. WR 112: 49

Juvenile grouse were more mobile than adults in fall, and females were consistently more mobile than males, except in winter. Winter movements were more restricted than those of fall, and winter movements were the same in all sex and age classes. Males returned to the same drumming sites in successive years. Most grouse were confined to relatively small areas, but one traveled 71 miles. Scattered 160-acre grouse management units in forested areas are suggested as preferable to a single large management area.

Hamerstrom, F. N., Jr. (Wis. Conserv. Dept., Plainfield.) SHARPTAIL BROOD HABITAT IN WISCONSIN'S NORTHERN PINE BARRENS. J. Wildl. Mgmt. 27(4): 793-802, 3 figs. Oct. 1963. WR 112: 49

Abstract: Analysis of 207 records of habitats in which about 193 broods were found clearly shows why openings in forested areas are vitally important to sharp-tailed grouse (Pedioecetes phasianellus campestris). Eighty percent of these observations were in open cover; 14 percent were in edge types; and 5 percent were more than 50 yards into woods. The occurrence of broods in and near food patches, farm fields, weedy old fields, and abandoned food patches suggests that in the sandy, sterile soils of the Barrens, food patches may have an unappreciated value for summer food. The greens and insects which accompany cultivation may be even more important than the grains which have been planted.

Hamerstrom, Frederick, and Frances Hamerstrom. (Wis. Conserv. Dept., Madison.) THE SYMPOSIUM IN REVIEW. J. Wildl. Mgmt. 27(4): 869-887. Oct. 1963. WR 112: 49

This symposium on the Tetraonidae presents current findings on such techniques as census, sex and age criteria, trapping, and artificial propagation; on such aspects of life history as food habits, breeding behavior, population structure and dynamics; turnover period, movements, habitat preferences, and the impact of land use on populations; the influence of weather, of predators, and of hunting; and on such applied management measures as regulations, stocking, and habitat management. A complete issue (Oct. 1963) of the Journal of Wildlife Management is devoted to this Grouse Management Symposium of 40 papers. This issue may be purchased for $2.50 from the Executive Secretary, Fred G. Evenden, The Wildlife Society, Suite 615, 2000 P Street, N.W., Washington, D. C.

Harper, Harold T. (Calif. Dept. Fish & Game, Sacramento.) THE RED-LEGGED PARTRIDGE IN CALIFORNIA. Proc. 43rd Ann. Conf. W. Assoc. State Game & Fish Comms. p. 193-195. [1963.] WR 112: 49

A total of 5,200 Turkish chukars have been released on 9 areas, and it appears that a wild population is becoming established on at least 2 areas. Releases totalling 3,000 Barbary partridges were made on 8 areas, but these plantings appear to have been unsuccessful.

Herman, Carlton M. (Patuxent Wildl. Res. Center, Laurel, Md.) DISEASE AND INFECTION IN THE TETRAONIDAE. J. Wildl. Mgmt. 27(4): 850-855. Oct. 1963. WR 112: 49

Abstract: Disease is one of many factors advanced to explain the fluctuations of grouse populations, but no profound study of natural disease losses in Tetraonidae exists. The literature contains frequent references to THE grouse disease, although many potential pathogens are listed in numerous surveys and limited investigations, and the relevant data indicate that no single etiologic

agent is universally responsible for disease in grouse. Few experimental infections or related studies on parasite biology have been attempted. Well-trained personnel and specialized facilities are required for research and analysis (1) to develop new methods of interpretation to be used with existing census techniques, (2) to conduct intensive studies of ecological factors of host and habitat, and (3) to establish base lines for recognition of deviations from the norm. Disease in wildlife can be controlled only through management procedures based on information concerning the biology of pathogens, hosts, and environments. It cannot be studied as a separate entity if its impact on survival or population fluctuations of grouse is to be correctly assessed.

Hoffman, Donald M. (Colo. Dept. Game, Fish & Parks, Denver.) THE LESSER PRAIRIE CHICKEN IN COLORADO. J. Wildl. Mgmt. 27(4): 726-732, 4 figs. Oct. 1963. WR 112: 50

Abstract: Lesser prairie chickens (Tympanuchus pallidicinctus), now rare though increasing in numbers in Colorado, were once fairly common in the southeastern part of the state, particularly in the area south of the Arkansas River. Information indicates that this species was probably once found in at least six counties: Baca, Prowers, Bent, Kiowa, Lincoln, and Cheyenne. Populations are thought to have occurred in earlier days in both the mixed prairie plant communities and the sand sagebrush-grassland plant communities. The species has been observed in Colorado during the period 1959 through 1962 only within the sand sagebrush-grassland plant communities and bordering cultivated fields. A major reduction in lesser prairie chicken range and numbers in Colorado apparently coincided with the general pasture depletion during the dust-bowl conditions of the 1930's. Populations have been censused through spring counts of cocks on booming grounds from 1959 through 1962. The numbers of cocks counted on the grounds have steadily increased over the 4-year period from 6 on three grounds in the spring of 1959 to 104 on thirteen grounds in the spring of 1962. Practices which have benefited the species in recent years include improved grassland management through rotation of pastures, moderate livestock use, and grass reseeding programs. Improved moisture conditions have also benefited the species.

Holmes, R. Bruce. (Univ. Kans., Lawrence.) VARIATION IN THE MUSCLES AND NERVES OF THE LEG IN TWO GENERA OF GROUSE (TYMPANUCHUS AND PEDIOECETES). Univ. Kans. Publ. Museum Nat. Hist. 12(9): 363-474, 20 figs. 1963. WR 112: 50

In most specimens there was as much variation between the muscles of the right and left legs of one individual as between individuals. No constant difference was found between the nerves of T. cupido pinnatus and T. cupido attwateri, but 17 constant differences in muscles were found between these 2 genera.

Jackson, A. S., and Richard DeArment. (Texas Game & Fish Comm., Canadian.) THE LESSER PRAIRIE CHICKEN IN THE TEXAS PANHANDLE. J. Wildl. Mgmt. 27(4): 733-737, 3 figs. Oct. 1963. WR 112: 50

Abstract: Trends in populations of lesser prairie chickens (Tympanuchus pallidicinctus) in the Texas Panhandle were investigated by censusing drumming grounds annually on two study areas during a 10-year period, 1952-62, for comparison with data from a census of the same areas in 1942. Severe drops in populations came in 1952. The decline was triggered by onset of a major drouth lasting through 1956, but populations did not increase during a series of good rainfall years starting with 1957. Changing land-use practices are responsible for keeping lesser prairie chickens at low population levels in the Texas Panhandle. The more important of these are overgrazing of cattle range, particularly in dry weather, resulting in displacement of the tall grasses; accelerated programs of aerial spraying with herbicides for brush control; and combine harvesting of grain sorghum in place of storage by stacking and shocking in the field.

Jenkins, David, Adam Watson, and G. R. Miller. (Univ. Aberdeen, Aberdeen, Scotland.) POPULATION STUDIES ON RED GROUSE, LAGOPUS LAGOPUS SCOTICUS (LATH.) IN NORTH-EAST SCOTLAND. J. Animal Ecol. 32(3): 317-376, 5 figs. Oct. 1963. WR 112: 51

The birds were territorial during the breeding season, and the number of breeding birds was influenced by the amount of available territory. Birds unable to find unoccupied territories dispersed to marginal habitats and died after becoming heavily parasitized and emaciated. Casualties among breeding birds were replaced by surplus non-breeders, and mortality did not regulate the number of territory owners. Good breeding success was correlated with good adult survival, heavy adult weights in Aug. and with a 1:1 sex ratio in spring. Breeding success was not related to summer weather, spring numbers of birds, or the amount of earlier dispersal.

Jenkins, David, Adam Watson, G. R. Miller, and D. E. Pinnock. NATURE CONSERVANCY UNIT OF GROUSE AND MOORLAND ECOLOGY / EIGHTH PROGRESS REPORT 1962. Scottish Landowners' Federation, 26 Rutland Square, Edinburgh 1, Scotland. 28 p., 5 figs. 1962. WR 112: 51

The most important conclusion so far is that grouse numbers are not determined primarily by variations in birth- or death-rates. The actual regulation is exerted through the interaction of weather and habitat.--From concl.

Jones, Robert E. (Okla. State Univ., Stillwater.) IDENTIFICATION AND ANALYSIS OF LESSER AND GREATER PRAIRIE CHICKEN HABITAT. J. Wildl. Mgmt. 27 (4): 757-778, 2 figs. Oct. 1963. WR 112: 51

Abstract: Essential components of the habitats of the lesser (Tympanuchus pallidicinctus) and the greater prairie chicken (Tympanuchus cupido pinnata) were analyzed comparatively on the basis of actual use by the birds. In general terms, the habitat of the lesser prairie chicken consisted of small units of shortgrass prairie intermixed with larger units of shrub or half-shrub vegetation; that of the greater prairie chicken consisted of small units of shortgrasses or midgrasses intermixed with larger units of tallgrasses. Insects were the primary food resources of the lesser prairie chickens. Major foods of the greater prairie chickens were obtained from plants. Day-resting lesser prairie chickens were found mostly in half-shrub vegetation; day-resting greaters used the edges of tallgrass and midgrass vegetation units. Both lesser and greater chickens chose units of moderately tall vegetation for night-roosting. Within these units, the actual roost sites were established where the vegetation was significantly shorter than most of the plants in the stand. Courtship areas of both species were composed of shortgrass units. Nesting areas were located less than 1/2 mile from courtship grounds. Nesting took place in areas of exceptionally heavy cover. When hatching was completed, greater prairie chicken females moved their broods into areas where the vegetation had been disturbed: old field, native shortgrasses, or cultivated pastures. This enabled the young to forage for insects associated with the forbs prevailing in these vegetation types. Lesser prairie chicken broods also utilized vegetation having abundant forb cover.

Jonkel, Charles J., and Kenneth R. Greer. (Mont. Fish & Game Dept., Helena.) FALL FOOD HABITS OF SPRUCE GROUSE IN NORTHWEST MONTANA. J. Wildl. Mgmt. 27 (4): 593-596, 2 figs. Oct. 1963. WR 112: 51

Abstract: Fifty-six crops of spruce grouse (Canchites canadensis) were collected during September and October of 1960, 1961, and 1962. Microscopic analyses of the crops showed that needles of the western larch (Larix occidentalis) were the principal food during this period, but consumption of this item declined in October. Other important foods were needles of pine (Pinus spp.), Engelmann spruce (Picea engelmanni), and Rocky Mountain juniper (Juniperus scopulorum); white clover (Trifolium repens); fruits of huckleberry (Vaccinium spp.), snowberry (Symphoricarpos rivularis), and white mandarin (Streptopus amplexifolius); and grasshoppers (Orthoptera).

June, James William. (Wyo. Game & Fish Comm., Green River.) WYOMING SAGE GROUSE POPULATION MEASUREMENT. Proc. 43rd Ann. Conf. W. Assoc. State Game & Fish Comms. p. 206-211. [1963.] WR 112: 52

Contains information on the following: strutting ground censuses, brood production, hunting success, impact of hunting on population, trapping and banding, and population dynamics of the sage grouse in Wyo.

Khanemedov, A. I. [ECOLOGY OF THE HUNGARIAN PARTRIDGE IN NE PARTS OF AZERBAYDJAN.] Izv. Akad. Nauk Azerb. SSR, Ser. Biol. & Med. Nauk 1962(1): 39-51. 1962. [From Auk 80(3), 1963. In Azerbaijani with Russian summary.] WR 112: 52

Deals with Perdix cinerea canescens, distributed in agricultural lands, forest edges, woodlots, grassland, and brush, up to 2,200 m. elevation. Density was 30 birds per 100 hectares, clutch size 14-24, about 66% of plant foods were weed seeds.

Lehmann, V. W., and R. G. Mauermann. (King Ranch, Kingsville, Texas.) STATUS OF ATTWATER'S PRAIRIE CHICKEN. J. Wildl. Mgmt. 27(4): 713-725, 3 figs. Oct. 1963. WR 112: 52

Abstract: The Attwater's prairie chicken (Tympanuchus cupido attwateri) is extinct in Louisiana and has decreased to approximately 1,335 in Texas. The decline since the last comprehensive studies of the 1930's has been approximately 7,365 chickens or 85 percent. Intensified use of grasslands, exclusion of controlled fire, oil development, predator increase, and expanded rice farming (now under a control program which actually encourages the breaking of additional prairie and the use of cultivated acres to the absolute limits of capability) are largely responsible. The current wide use of agricultural chemicals may also be important. Public sentiment favors a strong program to save Attwater's prairie chicken, a hallmark of the prairies that used to be. A program which conservation forces might apply immediately includes agreements with landowners, predator control, habitat improvement, transfer of chickens, establishment of a prairie chicken preserve, lease of nesting areas in fallow rice lands, multiple land-use management, continuation of closed season on prairie chickens, warning signs on roads, and enlarged life-history and management studies.

Lumsden, Harry G., and Robert B. Weeden. (Ontario Dept. Lands & Forests, Maple, Ontario, Canada.) NOTES ON THE HARVEST OF SPRUCE GROUSE. J. Wildl. Mgmt. 27(4): 587-591. Oct. 1963. WR 112: 52

Abstract: Spruce grouse (Canachites canadensis subspp.) are hunted in Maine, Montana, Idaho, Washington, Alaska, and all Canadian provinces and territories except Nova Scotia and Prince Edward Island. Three provinces and one state have estimated total harvests of the species: (1) in Manitoba, the average harvest was 1,741 per year (range 322-3,792) in 17 open seasons, 1935-58; (2) Saskatchewan took 3,858-9,634 (average 6,106) during 1952-58; (3) British Columbia estimated a harvest of 17,000-49,000 spruce grouse per year (average 30,000) for 1951-56; (4) in Montana, the take for 1958-61 was estimated at 11,506-27,018 (average 19,309). No estimate is available of the total harvest in Ontario, but some data on sex and age ratios for 1957-62 are presented. Young grouse were taken at the ratio of 2.5-7.3 (average 4.1) per adult female. Differential coloration of breast feathers in males and females and the longer, blacker tails of most males serve to distinguish the sexes. In autumn, differential molt pattern of remiges may allow age determination of spruce grouse. In spring, old males of the subspecies C. c. franklini may be distinguished from young males by the broad white tips on the upper tail coverts. All these techniques need further testing.

Marchelewski, J. H. [THE ARTIFICIAL REARING OF TETRAONIDS.] Przeglad Zool. 1: 202-209. 1957. [From Auk 80(3), 1963. In Polish with English summary.] WR 112: 52

The artificial rearing of capercaillie, black grouse, and hazel grouse is dealt with on the basis of the author's extensive experiments. Mortality of chicks, even after four months, was very high. Cause was enterohepatitis of a fungus origin. The pathogene--Candida albicans.

Marshall, William H., and John J. Kupa. (Univ. Minn., St. Paul.) DEVELOPMENT OF RADIO-TELEMETRY TECHNIQUES FOR RUFFED GROUSE STUDIES. Trans. 28th N. Am. Wildl. Conf. p. 443-456, 4 figs. 1963. WR 112: 53

Summary: The development of a system for radio-telemetry studies of the ruffed grouse describing the equipment, the techniques, and some results obtained is presented. The cost [$2,385] of this system and the potentials for further studies are discussed briefly.

Mohler, Levi L. (Idaho Fish & Game Dept., Boise.) WINTER SURVEYS OF NEBRASKA PRAIRIE CHICKENS AND MANAGEMENT IMPLICATIONS. J. Wildl. Mgmt. 27(4): 737-738. Oct. 1963. WR 112: 53

Abstract: Fall and winter counts of prairie chickens (Tympanuchus cupido pinnatus) showed that individual flocks on local home ranges contained more chickens in late fall than earlier, suggesting the practicability of winter population surveys. Chickens remained in winter mainly at areas where corn on small general farms provided food, and adjacent extensive grasslands on cattle ranches provided suitable roosting cover. It is suggested that additional winter habitat could be developed by combining corn-growing and controlled grazing in selected areas.

Moran, Richard J., and Walter L. Palmer. (Mich. Dept. Conserv., Houghton Lake Heights.) RUFFED GROUSE INTRODUCTIONS AND POPULATION TRENDS ON MICHIGAN ISLANDS. J. Wildl. Mgmt. 27(4): 606-614, 1 fig. Oct. 1963. WR 112: 53

Abstract: Ruffed grouse (Bonasa umbellus) have been successfully introduced on five of Michigan's Great Lakes islands where these birds were not found naturally. Wild-trapped grouse were established on High Island in 1956 and on Garden Island in 1957 at a stocking rate of 5 birds per square mile. A release of 63 hand-reared birds (parasite-free) on 3.5-square-mile Hog Island was an apparent failure. Regardless of island size, introduced grouse rapidly dispersed throughout the range and according to spring drumming surveys and fall flush counts, reached maximum densities in four breeding seasons. The initial population surge has resulted in abnormally high fall densities (flushing rates of 5-10 grouse per hour), although the highest spring breeding density calculated was 5 grouse per 100 acres. High fall populations apparently resulted from good nesting success (most hens had broods) rather than from unusual clutch size. Overwinter losses were between 60 and 75 percent, which appeared to be high for such rapidly mounting populations. Breeding numbers increased threefold and fourfold on High and Garden islands, respectively, following one breeding season. After the second breeding season, spring populations doubled on High and tripled on Garden. Subsequent leveling off of spring densities coincided with the appearance of high fall populations. The Beaver Island control population established in 1948 peaked (out of synchrony with mainland trends) in 1954, but has since conformed to the normal cycle of grouse depression in the middle and late '50's followed by recovery in 1961-62.

Mussehl, Thomas W. (Mont. Fish & Game Dept., Hamilton.) BLUE GROUSE BROOD COVER SELECTION AND LAND-USE IMPLICATIONS. J. Wildl. Mgmt. 27(4): 547-555, 2 figs. Oct. 1963. WR 112: 53

Broods used areas with plant cover relatively uniform in regard to height, canopy coverage and plant interspersion. Adequate plant cover is critical for broods as grouse ranges often overlap areas grazed by domestic stock and big game.

Nygren, Larry R. A CONTRIBUTION TOWARD THE BIBLIOGRAPHY OF ALECTORIS PARTRIDGES. Utah State Univ. (Logan), Coop. Wildl. Res. Unit, Spec. Rept. no. 9. 16 p., mimeo. Jan. 1963. WR 112: 53

This appears to be a reasonably complete bibliography of North American popular and scientific publications on the chukar partridge.

Nygren, Larry Rene. SUMMER HABITS AND HABITAT OF CHUKAR PARTRIDGE IN NORTHERN UTAH. M.S. thesis, Utah State Univ. 59 p. 1963. WR 112: 53

Palmer, Walter L. (Mich. Dept. Conserv., East Lansing.) RUFFED GROUSE DRUMMING SITES IN NORTHERN MICHIGAN. J. Wildl. Mgmt. 27(4): 656-663, 2 figs. Oct. 1963. WR 112: 54

Abstract: A study was made of 40 ruffed grouse (Bonasa umbellus) drumming logs known to be used one or more springs, 1951-59, in the Rifle River Area, Ogemaw County, Michigan. Thirty-four logs were old, decayed conifers. Logs had a mean height of 11.9 inches, a mean width of 13 inches, and a mean length of 19.8 feet. Minimum log sizes were 7.5 inches in diameter (height + width)/2 and 5.5 feet in length. No correlation existed between several log measurements (diameter, length, mass, or azimuth of log axis) and repeated annual use. Woody vegetation around the logs was divided into seven arbitrary size classes and studied by a system of 1/4-milacre quadrats and 1/100-acre transects. Plants less than 2 feet high were significantly less dense near the logs than elsewhere in the cover, but those over 8 feet high were significantly more dense near the logs. There was no correlation between stem densities and the number of years the logs had been used for drumming. Thirty-seven woody plant species were tallied on the 360 quadrats used, and seven additional species were found on the 160 transects. In the large-shrub class, which furnished the most important grouse cover, 73.2 percent of the stems tallied were speckled alder (Alnus rugosa). This and other plant species supplying the necessary understory cover for grouse are unpalatable to deer. There is urgent need for deer control and habitat manipulation to supply adequate grouse cover, especially in upland areas.

Palmer, Walter L., and Carl L. Bennett, Jr. (Mich. Dept. Conserv., East Lansing.) RELATION OF SEASON LENGTH TO HUNTING HARVEST OF RUFFED GROUSE. J. Wildl. Mgmt. 27(4): 634-639, 1 fig. Oct. 1963. WR 112: 54

Abstract: Populations of ruffed grouse (Bonasa umbellus) were compared on hunted and unhunted areas through a population cycle--from a near high in 1950 through a low in 1956 and 1957 to another high in 1962. Population size on two study areas was determined by means of strip censuses and drumming counts on representative portions. Effect of hunting on the one population was determined from harvest data. We found no correlation between population size and age ratios in the hunter's bag. A shortage of adult hens in the bag in 2 of the 3 poorest years may have been a result of high hen mortality during the spring nesting season brought on by subnormal temperatures. Population turnover from fall to spring averaged between 60 and 70 percent on hunted and unhunted areas alike. Although the kill by hunters averaged almost 30 percent of the one population, spring populations were comparable with those on the unhunted area. Kill data for the hunted area, which receives up to four times as much hunting pressure as do other comparable areas in Michigan, suggest that a much longer hunting season would not substantially increase the grouse kill. Thus, a greatly extended hunting season on a statewide basis would seem to be readily justifiable.

Prawdzik, Thomas R. (Mich. Dept. Conserv., Ishpeming.) RUFFED GROUSE ESCAPING A COOPER'S HAWK. J. Wildl. Mgmt. 27(4): 639-642, 1 fig. Oct. 1963. WR 112: 54

Abstract: A ruffed grouse (Bonasa umbellus) pursued by a Cooper's hawk (Accipter cooperii) was so badly frightened that it lost its normal fear of man. It allowed itself to be dug out of the snow into which it had burrowed in attempting to escape the hawk and remained passive in the author's hands. Though tossed into the air several times, it refused to fly away, but simply dropped to the snow and buried itself again. Two other accounts of birds similarly frightened are quoted.

Ritcey, R. W., and R. Y. Edwards. (Dept. Recreation & Conserv., Kamloops, British Columbia, Canada.) GROUSE ABUNDANCE AND JUNE TEMPERATURES IN WELLS GRAY PARK, BRITISH COLUMBIA. J. Wildl. Mgmt. 27(4): 604-606, 1 fig. Oct. 1963. WR 112: 54

High temperatures in late spring and early summer appeared to be an important factor in reproductive and hunting success.--From abstr.

Rogers, Glenn E. (Colo. Game, Fish & Parks Dept., Grand Junction.) BLUE GROUSE CENSUS AND HARVEST IN THE UNITED STATES AND CANADA. J. Wildl. Mgmt. 27 (4): 579-585. Oct. 1963. WR 112: 55

Abstract: Census procedures for blue grouse (Dendragapus obscurus) varied from intensive studies in Montana, Washington, and British Columbia to no work in Alaska, Arizona, the Northwest Territories, and Yukon. Extensive studies, varying as to degree, were conducted by Alberta, California, Colorado, Idaho, New Mexico, Nevada, Oregon, Utah, and Wyoming. The 1960 estimates indicated that approximately 300,000 blue grouse were harvested in North America. Estimates of grouse harvest were obtained by most states and provinces from questionnaires mailed to a random sample of small-game hunters. Grouse harvest by species was estimated from check-station figures. Data sample size was small for both census and harvest.

Sharp, Ward M. (Northeastern Forest Expt. Sta., Warren, Pa.) THE EFFECTS OF HABITAT MANIPULATION AND FOREST SUCCESSION ON RUFFED GROUSE. J. Wildl. Mgmt. 27(4): 664-671. Oct. 1963. WR 112: 55

Abstract: Response of a ruffed grouse (Bonasa umbellus) population to a deteriorating habitat was studied for 6 years following 7 years of habitat manipulation. Manipulation of the habitat was accomplished by cutting operations, creating openings 0.25-1 acre in area in a 735-acre pole-timber forest. Regrowth of coppice from stump sprouting in the cuttings was undisturbed during the 13-year study except for a few experimental plots where coppice was removed at 4-year intervals. Conversion of openings to sapling stands was progressive. By the seventh season, these openings were losing the herb and other ground-layer vegetation because of shading. Grouse brood use began to decline. By the end of 10 years, the openings were filled in by a dense brushy canopy and were of little value as brood feeding grounds. Adult grouse were not affected by the closed-canopy forest because of their ability to move to favorable feeding sites. The population of adults declined because of deteriorating brood-range conditions and an inadequate source of reproductive replacement from good brood habitats.

Smith, Neil D., and Irven O. Buss. (Wash. State Univ., Pullman.) AGE DETERMINATION AND PLUMAGE OBSERVATIONS OF BLUE GROUSE. J. Wildl. Mgmt. 27 (4): 566-578, 6 figs. Oct. 1963. WR 112: 55

Weekly photographs and word descriptions are given of birds through their first 16 weeks of life. Growth rates of post-juvenile primaries and rectrices, rather than feather loss, provided the chief means for aging birds during the third to eleventh weeks. Adults and subadults were separated by the "pointed condition of primaries 1 and 2 in the subadults, and the rounded condition of these primaries in the adults."

Stokes, Allen W. (Utah State Univ., Logan.) AGONISTIC AND SEXUAL BEHAVIOUR IN THE CHUKAR PARTRIDGE (ALECTORIS GRAECA). Animal Behaviour 11(1): 121-134, 3 figs. Jan. 1963. WR 112: 55

Agonistic and sexual behavior of 9 male and 5 female caged chukar partridges were studied and described in detail. Bibliography of 29 items.

Tomlinson, Roy E. (Dept. Game & Fish, Albuquerque, N. Mex.) A METHOD FOR DRIVE-TRAPPING DUSKY GROUSE. J. Wildl. Mgmt. 27(4): 563-566, 1 fig. Oct. 1963. WR 112: 55

The trap consisted of two 75-foot wings, and the birds were driven into the trap by a crew of 4 men. All birds in 5 broods were captured and all but 1 bird in each of 2 additional broods. Two broods were accidentally flushed before capture. The trap cost about $55, and about 2 hours were used capturing each brood.

Weeden, Robert B. (Alaska Dept. Fish & Game, College.) MANAGEMENT OF PTARMIGAN IN NORTH AMERICA. J. Wildl. Mgmt. 27(4): 673-683. Oct. 1963. WR 112: 56

Abstract: Ptarmigan are monogamous, territorial game birds of arctic and alpine tundras. They are gregarious and migratory or nomadic from late summer until spring. Sex-segregation occurs in winter. Populations of rock (Lagopus mutus) and willow ptarmigan (L. lagopus) fluctuate widely from year to year; whether the fluctuations are rhythmic is not known. Breeding densities commonly range from 1 to 10 pairs per square mile. Ptarmigan habitat is unusually free from human disturbance. Most ptarmigan harvested in North America now are killed primarily for food; the main harvest occurs in winter. Sport hunting exists on a small fraction of ptarmigan range. The only active management of ptarmigan is through regulation of harvest. Present regulations are set with no knowledge of ptarmigan numbers, the kill, or the effect of one on the other. Lack of access to ptarmigan range restricts the harvest. Greater future demand for ptarmigan as a recreational resource is expected; research is needed to establish a basis for an intelligent management program.

Yeatter, Ralph E. (Ill. Nat. Hist. Surv., Urbana.) POPULATION RESPONSES OF PRAIRIE CHICKENS TO LAND-USE CHANGES IN ILLINOIS. J. Wildl. Mgmt. 27(4): 739-757, 8 figs. Oct. 1963. WR 112: 56

Abstract: Censuses taken every spring from 1936 to 1963 on booming grounds of a remnant prairie chicken (Tympanuchus cupido) population near Hunt in Jasper County in southeastern Illinois show a gradual decline in numbers resulting probably from a progressive deterioration of habitat. This deterioration involves several factors: (1) a decrease in production of redtop (Agrostis alba), which formerly provided excellent nesting and brood cover for prairie chickens; (2) replacement of redtop by legume hays, which are often harvested at about the time when prairie chicken broods are hatching, with consequent destruction of nests and young birds; (3) growth of intensive cultivation, resulting in destruction of grass cover in formerly idle fields. Investigations on the 2,560-acre study area showed that topography as well as cover influenced distribution, with chickens generally preferring well-drained, gently sloping terrain. Conservation procedures recommended include purchasing land for refuges, leasing hayfields and other small areas of grassy nesting cover; encouraging farmers to set aside strips of land along ditches, lanes, and possibly fences; and perhaps planting wild grasses on refuges.

TURKEY

MacDonald, Duncan. (N. Mex. Dept. Game & Fish, Albuquerque.) TRAPPING AND MARKING MERRIAM'S WILD TURKEYS. Proc. 43rd Ann. Conf. W. Assoc. State Game & Fish Comms. p. 196-201. [1963.] WR 112: 56

Back tags, attached with leather harness were retained better than butt-end monel leg bands. Colored plastic leg bands were of little value because of poor observability and retention. Turkeys moved considerable distances from winter to summer ranges but returned to the same general areas in successive winters.

Mace, Robert U. (Oreg. State Game Comm., Portland.) OREGON'S EXPERIENCE WITH MERRIAM'S TURKEY. Proc. 43rd Ann. Conf. W. Assoc. State Game & Fish Comms. p. 202-205. [1963.] WR 112: 56

A progress report on efforts to establish and transplant turkeys in Oreg. Fourteen hens of the 26 released were observed with broods. The most noticeable change during the second year was a shift in the nesting habits. Most hens moved westward to higher elevations for nesting and brood rearing.

Suetsugu, Harvey Y., and Karl E. Menzel. (Game, Forestation & Parks Comm., Lincoln, Nebr.) WILD TURKEY INTRODUCTIONS IN NEBRASKA. Trans. 28th N. Am. Wildl. Conf. p. 297-307, 1 fig. 1963. WR 112: 56

Twenty-eight Merriam's turkeys were introduced into western Nebr. in 1959. By 1962, there were at least 3000 present. That year, during the first open season, 500 permittees bagged 281 turkeys.--From summ.

DOVES AND PIGEONS

Lehrman, Daniel S. (Rutgers Univ., New Brunswick, N. J.) ON THE INITIATION OF INCUBATION BEHAVIOUR IN DOVES. Animal Behaviour 11(4): 433-438. Oct. 1963. WR 112: 57

Reply to an article by Oscar Riddle (WR 112: 38) objecting to conclusions presented in various research articles during 1955-1961. Riddle particularly objects to Lehrman's statements to the effect that there is no evidence for the presence of sufficient prolactin secretion in ring doves just beginning to incubate to account for their incubation behavior and that progesterone appears to be able to induce incubation behavior without the presence of prolactin.

Merz, Robert L. (Univ. Kans., Lawrence.) JAW MUSCULATURE OF THE MOURNING AND WHITE-WINGED DOVES. Univ. Kans. Publ. Museum Nat. Hist. 12(12): 521-551, 22 figs. 1963. WR 112: 57

Morphology (except the length of the beak and jaw muscle), nesting, interbreeding and serology support the contention that these two doves are congeneric. The longer beak and jaw muscle of the white-winged dove is apparently an adaptation for nectar-feeding. Both species should be included in genus Zenaida.

Murton, R. K. NARCOTICS V. WOOD-PIGEONS. Agriculture 69(7): 336-339. 1962. [From J. Animal Ecol. 32(3), 1963.] WR 112: 57

Abstract: In thirty-four trials during the winters of 1959-60 and 1960-61, using mainly cereal baits with 1.5% by weight of alpha-chloralose, 1408 birds were captured. 57% were wood-pigeons, 23% were other species harmful to agriculture, and the rest were legally protected species and game birds. The risk to small protected species can be removed if peas and beans are used as bait. About half the pigeons in the baited areas were captured, and the cost per bird is less than that of shooting or nest destruction.

Murton, R. K., A. J. Isaacson, and N. J. Westwood. (Ministry Agr., Fisheries & Food, Tangley Place, Worplesdon, Surrey, England.) THE FEEDING ECOLOGY OF THE WOODPIGEON. British Birds 56(10): 345-375, 7 figs. Oct. 1963. WR 112: 57

On pastures in winter, 95% of the pigeon's day was spent searching for food. Each pigeon collected an average of 34,900 food items (47 g) per day. In Feb., the birds pecked 70 times per minute in the early morning and 103 per minute in the evening shortly before roosting time.

Soileau, Larry. (P. O. Box 585, Opelousas, La.) DOVE MANAGEMENT IN LOUISIANA. La. Conservationist 15(9/10): 10, 17, illus. Sept.-Oct. 1963. WR 112: 57

In a study of 396 mourning dove nests at Baton Rouge, La., nesting success was 62.9%. The season's total of doves was fledged by months as follows: Mar., 1.4%; April, 13.6%; May, 22.2%; June, 21.3%; July, 23.6%; Aug., 11.1%; Sept., 6.8%.

Wight, Howard M., and Earl B. Baysinger, compilers. (Patuxent Wildl. Res. Center, Laurel, Md.) MOURNING DOVE STATUS REPORT, 1963. US F&WS, Spec. Sci. Rept.--Wildl. no. 73. iv + 34 p., 3 figs. Sept. 1963. WR 112: 57

Abstract: An index to the 1963 mourning dove breeding population was obtained by a call-count survey conducted throughout the United States. Trends in the breeding population index were calculated for three management units and for hunting and nonhunting States within the management units. Trends in the breeding population indexes from 1962 to 1963 were as follows: Eastern Unit down 3.6 percent, Central Unit down 1.7 percent, and Western Unit up 3.8 percent. For the United States as a whole, the 1963 breeding population was down 0.8 percent from 1962. Summaries of call-count surveys conducted in Canada during 1962 and 1963 are included.

Berglund, Björn E., Kai Curry-Lindahl, Hans Luther, Viking Olsson, Wilhelm Rodhe, and Gunnar Sellerberg. ECOLOGICAL STUDIES ON THE MUTE SWAN (CYGNUS OLOR) IN SOUTHEASTERN SWEDEN. Acta Vertebratica 2(2): 167-288, illus. 1963. WR 112: 58

The 11 chapters are as follows: Introduction, Björn Berglund; Physico-geographical survey of the investigated area in Blekinge, Björn Berglund; The general ecology of the mute swan in Blekinge, Björn Berglund; Plant-biological investigation of the grazing localities of the mute swan in Blekinge, Björn Berglund; The food selection of the mute swan in Blekinge, Björn Berglund; Chemical and bacteriological studies at localities in Blekinge grazed by mute swans, Wilhelm Rodhe; Fishery-biological aspects of the occurrence of the mute swan along the coast of Blekinge, Gunnar Sellerberg; Nutritional biology of the mute swan in Valdemarsviken in Småland and Östergötland, Viking Olsson; Botanical analysis of mute swan faeces, Hans Luther; The ecological importance of the mute swan. Conclusions., Björn Berglund; and The migrations and winter quarters of the Swedish mute swan, Viking Olsson.

Brazda, A. R., R. C. Hanson, R. H. Smith, and G. H. Jensen. WINTER WATERFOWL SURVEY -- MEXICO / JANUARY 1963. US F&WS (Washington, D. C.). iii + 51 p. July 1963. WR 112: 58

Habitat conditions, flight data and waterfowl populations are summarized by region (east coast, Mexican highlands and west coast and interior areas) for the January 1963 flights. Comparisons with past surveys are made. Decreases were noted for all regions except for the Mexican highlands. Greater populations than in 1962 were prevalent for most species in this region except the coot. Coots decreased 20%.

Caldwell, J. Robert. (Ducks Unlimited, Saskatoon, Saskatchewan, Canada.) SOME RECORDS OF THE CANADA GOOSE BREEDING IN SOUTHWESTERN SASKATCHEWAN. Blue Jay 21(2): 62-63. June 1963. WR 112: 58

Drought and the activities of man almost eliminated breeding Canada geese from southern Saskatchewan before 1937. Water levels and goose populations have risen so that by 1958 broods were being reared on most of the large lakes. There has been a decline in the population since 1961.

Canadian Wildlife Service. (150 Wellington St., Ottawa, Ontario.) QUESTIONS AND ANSWERS ON CANADA'S MIGRATORY BIRD REGULATIONS. Canadian Wildl. Serv. 11 p., illus. 1963. WR 112: 58

Contains basic information every hunter should have before hunting waterfowl in Canada.

Chabreck, Robert H. (Route 1, Box 20-B, Grand Chenier, La.) BREEDING HABITS OF THE PIED-BILLED GREBE IN AN IMPOUNDED COASTAL MARSH IN LOUISIANA. Auk 80(4): 447-452. Oct. 1963. WR 112: 58

Information is given on breeding biology and nesting success of the pied-billed grebe based on observations of 107 nests found in a brackish water impoundment in southern La.

Cornwell, George. (Va. Polytech. Inst., Blacksburg.) OBSERVATIONS ON WATERFOWL MORTALITY IN SOUTHERN MANITOBA CAUSED BY ECHINURIA UNCINATA (NEMATODA, ACUARIIDAE). Canadian J. Zool. 41(4): 699-703, 1 fig. + 5 figs. on 2 pls. May 1963. WR 112: 58

Abstract: An outbreak of echinuriasis caused by the nematode Echinuria uncinata is reported in the ducks and swans of southern Manitoba. Treatment in trumpeter swan cygnets with piperazine citrate was attempted. Symptoms and lesions characteristic of chronic echinuriasis are described. Ecological factors of this disease, and its possible association with drought are discussed. New host records for Echinuria uncinata are Anas discors, Aythya valisineria, and Olor buccinator.

Cornwell, G. W., and A. B. Cowan. (Va. Polytech. Inst., Blacksburg.) HELMINTH POPULATIONS OF THE CANVASBACK (AYTHYA VALISINERIA) AND HOST-PARASITE-ENVIRONMENTAL INTERRELATIONSHIPS. Trans. 28th N. Am. Wildl. Conf. p. 173-199, 6 figs. 1963. WR 112: 59

Canvasbacks collected on the Detroit River in a diseased condition had nearly 5 times as many helminths as their "normal" counterparts collected at the same time. Apparently "normal" breeding ground adults were nearly as heavily parasitized as diseased canvasbacks taken on the Detroit River, although cestodes were by far the most common in the former and trematodes in the latter. Adults from "molting" lakes, and especially those feeding on large amounts of the alga Chara sp., were almost entirely free of intestinal helminths. Ducklings carried 5 times as many helminth parasites as adults. Ducklings collected from marshes were more heavily parasitized than those from potholes. Great variations were observed in the helminthfauna of ducklings from the same pothole, and even from the same brood. Ducklings of the same brood, however, had certain similarities in the species composition of the helminthfauna, and it is theorized that the large differences in numbers of helminths reflect food preferences of individual ducklings. In comparing ducklings of different ages, it was apparent that large numbers of helminths were present by the second week of life, and that the majority of these were tapeworms. There is some indication that peak helminth populations are reached in ducklings 8-9 weeks old, and that by the twelfth week their numbers begin to decline.--From summ.

Duffy, McFadden. (La. Wildl. & Fisheries Comm., 400 Royal St., New Orleans.) WHAT HAS HAPPENED TO THE CANADA GOOSE. La. Conserv. 16(1&2): 2-4, illus. Jan.-Feb. 1964. WR 112: 59

As a result of artificial feeding at refuges and of increased availability of waste corn associated with mechanical harvesting further north, the number of Canada geese wintering in La. has declined markedly in the past 15 years to 6000-8000 birds. In an effort to build up a resident population in La., 2000 birds were trapped in Mo., wing-clipped and released on a fenced area in La. Some 350,000-400,000 blue and snow geese annually winter in La.

Geis, Aelred D. (Migratory Bird Populations Sta., Laurel, Md.) ROLE OF HUNTING REGULATIONS IN MIGRATORY BIRD MANAGEMENT. Trans. 28th N. Am. Wildl. Conf. p. 164-172, 1 fig. 1963. WR 112: 59

Conclusions: Information available thus far suggests that the phenomena that cause hunting regulations to have little effect on the status of resident game species do not apply to migratory game birds. Hunting regulations influence the proportion of migratory game bird populations that are harvested which in turn influences annual mortality rates. Furthermore, there is little evidence to suggest that increased hunting mortality is compensated for by either a reduction in non-hunting mortality or by increased production. This emphasizes the important role of hunting regulations in migratory bird management.

Goodwin, Harry A. (U. S. Bur. Sport Fisheries & Wildl., Portland, Oregon.) WATER DEVELOPMENT AND WATERFOWL MANAGEMENT. Proc. 42nd Ann. Conf. W. Assoc. State Game & Fish Comms. p. 102-111. 1962 [1963]. WR 112: 59

This is a review of the waterfowl management projects operating and planned in ten western states.

Hunt, George S., and Archibald B. Cowan. (Univ. Mich., Ann Arbor.) CAUSES OF DEATHS OF WATERFOWL ON THE LOWER DETROIT RIVER--WINTER 1960. Trans. 28th N. Am. Wildl. Conf. p. 150-163, 4 figs. 1963. WR 112: 59

From mid-March to early April, 1960, duck mortality on the lower Detroit River totalled approximately 12,000. It was concluded that most of the ducks died as a result of having their feathers oiled. Spectrographs of oil from dead specimens showed that esters were present. This appears to be the first time esters have been found associated with losses of waterfowl.--From summ.

Kenyon, Karl W. (US F&WS, Sand Point Naval Air Sta., Bldg. 192, Seattle, Wash.) FURTHER OBSERVATIONS OF WHOOPER SWANS IN THE ALEUTIAN ISLANDS, ALASKA. Auk 80(4): 540-542, 1 fig. Oct. 1963. WR 112: 60

"Available data indicate that the Whooper Swan may occur regularly in fall, late winter, and early spring in the outer Aleutian Islands."

Ling, P. G. [ON NEW COLONIES OF CYGNUS OLOR IN THE ESTONIAN SSR.] In: (Ecology and migrations of birds of the Baltic region.) Akad. Nauk Latviisk. SSR. (Riga). p. 81-83. 1961. [From Biol. Abstr. 43(1), 1963, from Referat. Zhur., Biol., 1962, no. 22I126. Transl. from Russian abstr.] WR 112: 60

The number of C. olor in the Baltic region has gradually increased and its area of distribution has extended, apparently as a result of reproduction among local populations and also by the migration of C. olor from the S, probably from Poland, Denmark, and other countries on the shores of the North Sea.--From abstr.

Martin, Pant W. BREEDING TERRITORIALISM, FAMILY ORGANIZATION, AND POPULATION DYNAMICS OF THE CANADA GOOSE ON THE OGDEN BAY REFUGE, UTAH. Ph.D. thesis, Utah State Univ. 85 p. 1963. WR 112: 60

Miller, A. Wendell. (SCS, North Highlands, Calif.) WATERFOWL HABITAT IMPROVEMENT IN CALIFORNIA. Proc. 42nd Ann. Conf. W. Assoc. State Game & Fish Comms. p. 112-116. 1962 [1963]. WR 112: 60

Chief marsh management practices are drainage and reflooding, cultivation, water level manipulation, changing the salinity or alkalinity of the water, use of fire, and chemical or biological control of aquatic vegetation.

Nelson, Harvey K. (Bur. Sport Fisheries & Wildl., Minneapolis, Minn.) RESTORATION OF BREEDING CANADA GOOSE FLOCKS IN THE NORTH CENTRAL STATES. Trans. 28th N. Am. Wildl. Conf. p. 133-150. 1963. WR 112: 60

State and federal areas in the North Central States are annually producing 4000-4500 Canada geese. There is little doubt that production could be substantially increased through more intensive management and expansion of the program.--From summ.

Pejler, Birger. (Zool. Inst., Uppsala, Sweden.) OM SJÖFÅGLAR OCH SJÖTYPER. [ON WATERBIRDS AND TYPES OF LAKES.] Vår Fågelvärld 21(4): 267-274, illus. 1962. [From Biol. Abstr. 43(1), 1963. (In Swedish) with English summ.] WR 112: 60

On the average, large lakes contain more species than small ones. Their fauna is also more heterogenous, consisting of forms typical of oligotrophic waters as well as those indicating eutrophy.--From abstr.

Sieh, James G., and William Aspelmeier. (Iowa Conserv. Comm. Biol. Sta., Spirit Lake.) SEMI-CONTROLLED HUNTING OF WATERFOWL AT LAKE ODESSA, LOUISA COUNTY, IOWA--1960 AND 1961. Proc. Iowa Acad. Sci. 69: 265-273, 4 figs. 1962. WR 112: 60

Abstract: In 1960 and in 1961 two "controlled" shooting areas with a total of 25 "blind" sites were established at Lake Odessa, Wapello, Iowa. The remaining "uncontrolled" portion of the public hunting area was open without special restrictions. Checking stations were operated at each of the two main access points. A total of 6,014 hunters harvested 6,499 waterfowl in 33,968 hours, averaging one bird for each 5.2 hours of hunting in 1960. In 1961 a total of 3,391 hunters killed 3,391 waterfowl in 17,618 hours, averaging one bird for each 5.2 hours of hunting. Hunter success, expressed as the number of ducks per hunter per day, was 1.1 in 1960 and 1.0 in 1961; however, the aggregate harvest dropped 48 per cent in 1961. Season length was reduced 40 per cent and there was a 44 per cent drop in the number of hunters. The reduction in daily bag from 3 to 2 ducks had little if any effect upon the total harvest, and the reduction in season length was almost entirely responsible for the 43 per cent drop in mallard kill. Mallards comprised 78 per cent of the harvest and wood ducks 7 per cent. Flight dates during the 1961 season

were indicated by peak kills of mallards on October 23, November 3, 8, and 17. The sex ratio of mallards in the kill averaged 1.5 males to 1 female during both years, but increased during the major flight dates to 1.7:1, indicating a preponderance of drakes within the population, selectivity on the part of hunters and their preference for drakes. Age ratios of mallards obtained at checking stations and from wing examination were almost identical (0.7:1 and 0.8:1) indicating very poor production of mallards supplying young birds for hunters at Lake Odessa in 1961.

Smith, Robert Irvin. THE SOCIAL ASPECTS OF REPRODUCTIVE BEHAVIOR IN THE PINTAIL (ANAS ACUTA ACUTA, L.). Ph.D. thesis, Utah State Univ. 72 p. 1963. WR 112: 61

Timmerman, A. DE BRANDGANS (BRANTA LEUCOPSIS) IN NEDERLAND. [ON THE OCCURRENCE OF THE BARNACLE GOOSE IN THE NETHERLANDS.] Limosa 35(3-4): 199-218, [3] figs. 1962. [In Dutch with English summary.] WR 112: 61

"Between a half and two-thirds of the world population of this bird winters in the Netherlands."

CRANES, RAILS, SHOREBIRDS

Braaksma, S. VOORKOMEN EN LEVENSGEWOONTEN VAN DE KWARTELKONING (CREX CREX L.). [DISTRIBUTION AND HABITS OF THE CORNCRAKE.] Limosa 35(3-4): 230-259, 5 figs. 1962. [In Dutch with English summary.] WR 112: 61

Jehl, Joseph R., Jr. (Univ. Mich., Ann Arbor.) AN INVESTIGATION OF FALL-MIGRATING DOWITCHERS IN NEW JERSEY. Wilson Bull. 75(3): 250-261, 2 figs. Sept. 1963. WR 112: 61

In L. g. griseus, and undoubtedly in L. g. hendersoni, there are three main peaks in migration; the first, in early July, consists of postbreeding females; the second, in late July or early August, consists mainly of adult males; the third, extending from mid-August to early September, is composed of birds of the year. The demonstration of differential migration of sexes allows us to postulate several aspects of the still-unstudied breeding biology of L. g. griseus. It appears that females play only a minor role in incubation and probably do not participate in caring for the chicks. Thus, males must assume the bulk of the nesting duties, remaining on the breeding grounds until the young are able to fend for themselves.--From summ.

Kahl, M. P., Jr., and L. J. Peacock. (Univ. Ga., Athens.) THE BILL-SNAP REFLEX: A FEEDING MECHANISM IN THE AMERICAN WOOD STORK. Nature 199(4892): 505-506, 1 fig. 3 Aug. 1963. WR 112: 61

Studies of Mycteria americana [Wood ibis] in Florida revealed that the bill-snap reflex permits these birds to secure food unavailable to species which locate their prey by vision alone. It also enables them to feed at night.

Martin, Pant W. (Patuxent Wildl. Res. Center, Laurel, Md.) WOODCOCK STATUS REPORT--1963. US F&WS Spec. Sci. Rept. no. 76. iv + 43 p. Sept. 1963. WR 112: 61

In a comparison of 1962 and 1963 data, a population decline of 7% was indicated east of the Appalachian Mountains, and an increase of 16% was indicated west of these mountains. It is doubtful if this represents a significant change in size of the breeding population from 1962 to 1963.--From abstr.

Shmit, E. [ARE WOOD COCKS POLYGAMOUS?] Okhotno i Okhotnoe Khoz. 4: 21-22. 1962. [From Biol. Abstr. 43(1), 1963, from Referat. Zhur., Biol., 1962, no. 19I221. Transl. from Russian.] WR 112: 61

Observations on the behavior of males at courting time cast doubt on the presence of polygamy in the woodcock (Scolopax rusticula).--From abstr.

HAWKS AND OWLS

Bernard, Richard F., and Bernard Klugow. (Wis. State Coll., Superior.) HAWK OWLS INVADE WISCONSIN. Passenger Pigeon 25(2): 47-50, illus. Summer 1963. WR 112: 62

Describes the 1962-1963 invasion of hawk owls in Wis. Details of 2 hawk owl nestings are reported.

Fitch, Henry S. (Univ. Kans., Lawrence.) OBSERVATIONS ON THE MISSISSIPPI KITE IN SOUTHWESTERN KANSAS. Univ. Kans. Publ., Museum Nat. Hist. 12(11): 505-519. 1963. WR 112: 62

Information is given on the following subjects: habitat, numbers, feeding, breeding cycle, mortality factors, defense and ratio of immatures to adults.

Keith, Lloyd B. (Univ. Wis., Madison.) A NOTE ON SNOWY OWL FOOD HABITS. Wilson Bull. 75(3): 276-277. Sept. 1963. WR 112: 62

Based on examination of 37 pellets, chief food of snowy owls in Wis. was Microtus (73% of pellets). Other major components of diet were muskrat (30% of pellets) and duck (24% of pellets).

Ratcliffe, D. A. (Nat. Conservancy, 12 Hope Terrace, Edinburgh, Scotland.) THE STATUS OF THE PEREGRINE IN GREAT BRITAIN. Bird Study 10(2): 56-90. June 1963. WR 112: 62

Except for local declines, numbers of peregrines (Falco peregrinus) showed little fluctuation during 1900-1955. Decline started about 1955. By 1962 only 13% of the earlier population was present. It was postulated that toxic agricultural chemicals may have been the cause of decline. Two eggs failing to hatch were analyzed and found to contain 4-5 ppm of chlorinated hydrocarbons.

Schmid, Frederick C. (Patuxent Wildl. Res. Center, Laurel, Md.) RECORD LONGEVITY OF A WILD RED-SHOULDERED HAWK. Bird-Banding 34(3): 160. July 1963. WR 112: 62

The banded bird was at least 20 years old when last captured. The recapture site was approximately 440 yards from the point of original capture.

Weller, Milton W., Leigh H. Fredrickson, and Fred W. Kent. (Iowa State Univ., Ames.) SMALL MAMMAL PREY OF SOME OWLS WINTERING IN IOWA. Iowa State J. Sci. 38(2): 151-160, 4 figs. 15 Nov. 1963. WR 112: 62

Abstract: Small mammal prey of three species of wintering owls was investigated in east-central Iowa. Pellets were collected periodically and analyzed dry to separate recognizable remains. Seven species of mammals were recorded and the dominance of meadowmice (Microtus pennsylvanicus and M. ochrogaster) indicated peak population levels of these species. Mammal trapping in the owl roosting areas produced quite different data on species composition of the mammalian fauna than was implied from the remains in owl pellets.

BLACKBIRDS, STARLINGS, CROWS

Bailey, Edgar Preston. THE ECOLOGY OF STARLINGS IN WINTER IN BOX ELDER COUNTY, UTAH. M.S. thesis, Utah State Univ. 97 p. 1963. WR 112: 62

Delvingt, W. LES MIGRATIONS DES ÉTOURNEAUX, STURNUS VULGARIS L., BAGUÉS OU REPRISES EN BELGIQUE. [MIGRATION OF THE STARLING, STURNUS VULGARIS L., BANDED OR RECOVERED IN BELGIUM.] Gerfaut 52: 59-172. 1962. [From Auk 80(3), 1963. In French.] WR 112: 62

Dobrowolski, Kazimierz A., Zygmunt Pielowski, Jan Pinowski, and Aleksander Wasilewski. DAS VORKOMMEN DES KOLKRABEN (CORVUS C. CORAX L.) IN POLEN IM ZUSAMMENHANG MIT SEINEN AREALS-UND QUANTITÄTSVERÄNDERUNGEN IN MITTELEUROPA. [THE OCCURRENCE OF THE RAVEN (CORVUS C. CORAX L.) IN POLAND AND THE RELATIONSHIP BETWEEN ITS AREAL AND QUANTITATIVE FLUCTUATION IN CENTRAL EUROPE.] Ekol. Polska Ser. A. 10(14): 375-456, 23 figs. 1962. In German with Polish summary. WR 112: 62

Gilfillan, Merrill C. (Ohio Dept. Nat. Resources, 1500 Dublin Rd., Columbus.) BIOLOGICAL PROBLEM / MODERN CONTROL OF BIRD DAMAGE. Ohio Conserv. Bull. 27(7): 24-26, 33, illus. July 1963. WR 112: 63

About 80% of the Ohio redwinged blackbirds come from nests in legume meadows, and about 25 million were produced in such Ohio meadows in 1962. "An interesting detail which apparently limits redwing nesting is that moisture is needed for shaping the nesting material. In a marsh, it may easily be wetted at anytime. On upland nesting sites, the nest building is done early in the morning and again at night when there is dew to provide moisture. This bit of adaptability has permitted the redwing to increase far beyond what it might otherwise have done." It is suggested that research should be aimed at finding "a weak link in the life history chain where the bird might be turned from its destructive ways, or the damage time and place might be circumvented." A second suggestion involves "research in genetics that the behavior pattern of the birds might be changed to a less objectionable form."

Johnston, Richard F. (Univ. Kans., Lawrence.) QUANTITATIVE SUPERNORMAL RELEASERS FOR NESTBUILDING AND EGG-LAYING IN STARLINGS. Kans. Ornithol. Soc. Bull. 14(3): 18-20. Sept. 1963. WR 112: 63

Starling nests were built or started, presumably by one bird, in each of 72 rooms of a martin house. Eggs were laid in three nests, with one nest receiving two eggs and two nests three eggs each. The eggs disappeared from all of the nests prematurely.

Liversidge, R. THE SPREAD OF THE EUROPEAN STARLING IN THE EASTERN CAPE. Ostrich 33: 13-16. 1962. [From Auk 80(3), 1963.] WR 112: 63

Reached Port Elizabeth 1954 and Uitenhage 1956. Spread by long jumps, the one controlling factor appearing to be the presence of European type dwellings.

Platt, Dwight R. (Bethel Coll., North Newton, Kans.) DIFFERENCES IN HABITAT OF EASTERN AND WESTERN MEADOWLARKS IN HARVEY COUNTY, KANSAS. Kans. Ornithol. Soc. Bull. 14(3): 17-18. Sept. 1963. WR 112: 63

In areas of sympatry of the eastern and western meadowlarks, the eastern species occurs more commonly in poorly drained habitats with the western more common in drier habitats.

Stewart, Paul A. (Patuxent Wildl. Res. Center, Laurel, Md.) ABNORMALITIES AMONG BROWN-HEADED COWBIRDS TRAPPED IN ALABAMA. Bird-Banding 34(4), 199-202. Oct. 1963. WR 112: 63

Externally visible abnormalities were found on 292 males and 29 females, an incidence of 3.9 percent of each sex. The following abnormalities were noted: pox and flesh mite nodules, scaly leg, cyst in submucosa of cloaca, broken and deformed legs and toes, recurved toenail, bill deformities, rear toe hooked around tarsus, punctured eyeball, and partial albinism.--From summ.

OTHER BIRDS

Baldwin, Paul H., and Nick K. Zaczkowski. (Mont. State Univ., Missoula.) BREEDING BIOLOGY OF THE VAUX SWIFT. Condor 65(5): 400-406, 3 figs. Sept. 1963. WR 112: 63

Covers egg laying period, incubation and hatching, nestling period, fledging and departure, development and natural nesting sites.

Belousova, A. A. [NOTES ON THE BIOLOGY OF THE SPANISH SPARROW.] Tr. Nauch.-Issled. Inst. Zashchity Rast. Kazakhsk. Akad. Sel'skokhoz. Nauk 6: 307-311. 1961. [From Biol. Abstr. 43(1), 1963, from Referat. Zhur., Biol., 1962, no. 21I166. Transl. from Russian abstr.] WR 112: 63

The sparrows readily ate the poisoned grain placed as bait on cleared lots around their nesting colonies. Picking each grain separately they fed on the swing-feeders. They visited readily the special feeder set up even after it had been sprayed with a suspension of potassium arsenate.--From abstr.

Cornwell, George W. (Va. Polytech. Inst., Blacksburg.) OBSERVATIONS ON THE BREEDING BIOLOGY AND BEHAVIOR OF A NESTING POPULATION OF BELTED KINGFISHERS. Condor 65(5): 426-431. Sept. 1963. WR 112: 64

Information is given on location and construction of nests, population and range, food and feeding habits, predation, mortality, desertion, and behavior.

Coulson, J. C. (Univ. Durham, Durham City, England.) THE STATUS OF THE KITTIWAKE IN THE BRITISH ISLES. Bird Study 10(3): 147-179, 6 figs. Sept. 1963. WR 112: 64

Since about 1900 the kittiwake population of England and Wales has been increasing at a rate of approximately 3% of the breeding population per year. During this period there has been a marked change in the type of cliffs chosen for nesting places (increasing use of lower cliffs). Man's viewpoint toward kittiwakes has shifted since the nineteenth century from predation to active protection. Man has also reduced the number of predatory birds, and kittiwakes now breed without interference from predators in many areas. The status of kittiwakes at numerous stations throughout the British Isles is tabulated.

Davis, John, George F. Fisler, and Betty S. Davis. (Univ. Calif., Hastings Reservation, Carmel Valley.) THE BREEDING BIOLOGY OF THE WESTERN FLYCATCHER. Condor 65(5): 337-382, 4 figs. Sept. 1963. WR 112: 64

Deals with seasonal status, habitat preference, determination of sex, hostile behavior, voice, and nesting biology of Empidonax difficilis.

de Melo Carvahlo, Jose Candido. SÔBRE UM CASO DE FOLBOFILIA DE ABELHA MANDASASIA EM CASA DE JOAODE-BARRO. [CONCERNING AN INSTANCE OF THE STINGLESS HONEYBEE IN THE NEST OF THE OVEN BIRD.] Atas Soc. Biol. Rio de Janeiro 6(3): 21. 1962. [From Biol. Abstr. 43(3), 1963. (In Portuguese).] WR 112: 64

The author reports an instance of the stingless honeybee (Melipona quadrifasciata anthidioides) inhabiting the nest of the oven bird Furnarius rufus badius. Opening of the nest revealed combs with brood and 2 with honey. Although the bee ordinarily nests in termite habitations, this is the first verified instance of the association with the oven bird.--From abstr. by A. Robinson, Jr.

Downs, Mrs. J. R. (S. Londonderry, Vt.) CAN BLUE JAYS SWIM? Bird-Banding 34(4): 221. Oct. 1963. WR 112: 64

A juvenile blue jay fell into a pond about 25 feet from shore. It propelled itself through the water with a hopping motion--pushing the water with wings and feet.

Eisenmann, Eugene. (Am. Museum Nat. Hist., N. Y.) IS THE BLACK VULTURE MIGRATORY? Wilson Bull. 75(3): 244-249. Sept. 1963. WR 112: 64

Summary: The black vulture is generally stated to be a resident species; published information seems lacking as to any group migration. Observations made in Panama during November 1962 of groups of black vultures moving eastward (apparently in the direction of South America), often accompanied by migratory Buteo hawks, suggest that this species may be partially migratory. The possibility is advanced that younger birds may be migratory, while breeding individuals may be essentially sedentary.

Erard, C. OBSERVATIONS SUR UN COMPORTEMENT DE MERLES NOIRS. [OBSERVATIONS ON THE BEHAVIOR OF BLACKBIRDS.] Nos Oiseaux 26: 238-243. 1962. [From Auk 80(3), 1963. In French.] WR 112: 64

Agonistic posturing is described for Turdus merula during feeding; dominant and soliciting individuals are described.

Farkas, T. FLAMINGOES. Fauna & Flora (13): 30-34, illus. 1962. WR 112: 64

General information is given on the two African species of flamingoes (Phoenicopterus ruber and P. minor). These birds are sometimes present in thousands at the Barberspan Bird Sanctuary, Transvaal, and constitute a tourist attraction.

Galindo, Pedro, Eustorgio Mendez, and Abdiel J. Adames. (Gorgas Memorial Lab., Apartado 6991, Panama, Panama.) BANDING OF MIGRANT THRUSHES IN ALMIRANTE, PANAMA. Bird-Banding 34(4): 202-209. Oct. 1963. WR 112: 65

In studies on migrating thrushes, 2,035 birds were mist-netted, banded and released during the fall of 1962 and the spring of 1963. Conclusions on the migration patterns of thrushes await the accumulation of recovery data.--From summ.

Harrison, J. M., and J. G. Harrison. CHANGING STATUS OF GULLS IN THE SEVENOAKS AREA. Kent Bird Rept. no. 8(1959): 46-51. 1961. [From J. Animal Ecol. 31(2), 1962.] WR 112: 65

The simultaneous appearance of a refuse tip [=dump] providing food and a flooded ballast pit with an island sandbank providing a roost has caused a big increase in the five common Larus gulls in the Sevenoaks district of Kent.

Higler, L. W. G. DE CENSUS VAN DE KOKMEEUW (LARUS RIDIBUNDUS L.) IN NEDERLAND, BELGIË EN LUXEMBURG IN 1961. [CENSUS OF THE BLACK-HEADED GULL IN BELGIUM, THE NETHERLANDS AND LUXEMBURG, 1961.] Limosa 35(3-4): 259-265, [2] figs. 1962. [In Dutch with English summ.] WR 112: 65

Increases of Larus ridibundus in this area during the 20th century paralled increases in England, Wales, Denmark, Norway, Sweden, Finland and France.

Isaac, Donald, and Peter Marler. (Univ. Calif., Berkeley.) ORDERING OF SEQUENCES OF SINGING BEHAVIOUR OF MISTLE THRUSHES IN RELATIONSHIP TO TIMING. Animal Behaviour 11(1): 179-188, 4 figs. Jan. 1963. WR 112: 65

With the use of audiospectrograms, 96 songs of an individual mistle thrush (Turdus viscivorus) from Kent, England, were compared with 13, 15, 25 and 31 songs of birds from Cambridge, England. The number of syllable types in the repertoire, their arrangement in sequences and the temporal segregation into syllable and song categories were of the same nature in all birds.--From summ.

Kilham, Lawrence. (Lyme, N. H.) FOOD STORING OF RED-BELLIED WOODPECKERS. Wilson Bull. 75(3): 227-234, 3 figs. Sept. 1963 WR 112: 65

Summary: Red-bellied woodpeckers are skillful in lodging and removing bits of food from storage places 2 to 3 inches deep within natural crevices by use of their long tongues. The depth of this storage appears to give protection against jays, titmice, and other competitors. Storing is done particularly in the fall. Red-bellied woodpeckers occupy individual areas three to four acres in extent at this season and are unlike the related red-headed woodpecker in being unaggressive in relation to stored food. Field observations were aided by observations on hand-raised individuals maintained in an aviary. Extraction of insect larvae from rotten logs, storage of miscellaneous objects, and other activities in which the tongue was used are described.

King, James R., S. Barker, and Donald S. Farner. (Wash. State Univ., Pullman.) A COMPARISON OF ENERGY RESERVES DURING AUTUMNAL AND VERNAL MIGRATORY PERIODS IN THE WHITE-CROWNED SPARROW, ZONOTRICHIA LEUCOPHRYS GAMBELII. Ecology 44(3): 513-521, 4 figs. Summer 1963. WR 112: 65

During fall migration Zonotrichia leucophrys gambelii has lower energy reserves in fat deposits than during spring migration. This difference was correlated with a slower rate and longer period of autumnal migration. Large differences in the levels of hepatic and pectoral-muscle glycogen in spring and fall suggest the existence of at least quantitatively different metabolic adaptations for the accumulation of lipid reserves during the two migratory seasons.--From summ.

Mackay, Violet Meekins, and William M. Hughes. (4014 W. 37th Ave., Vancouver, B.C., Canada.) CRESTED MYNAH IN BRITISH COLUMBIA. Canadian Field-Nat. 77(3): 154-162, 1 fig. July-Sept. 1963. WR 112: 65

The crested mynah (Acridotheres cristatellus) was introduced into Vancouver, British Columbia, in the 1890's, and a population of 20,000 birds was reached by 1927. By 1960 the population had declined to 2,000-3,000 birds. There has

been little spreading of the crested mynah, and the bird appears to be confined to the immediate vicinity of Greater Vancouver, with the exception of a small colony on Vancouver Island at Nanaimo. Information is given on the bird's breeding biology which was studied through the use of nesting boxes.

Macmillan, A. T. THE WAXWING INVASION OF NOVEMBER 1961. Scottish Birds 2: 85-89. 1962. [From J. Animal Ecol. 32(2), 1963.] WR 112: 66
Detailed records of the invasion of Nov. 1961.

Meanley, Brooke. (Patuxent Wildl. Res. Center, Laurel, Md.) NESTING ECOLOGY AND HABITS OF THE DICKCISSEL ON THE ARKANSAS GRAND PRAIRIE. Wilson Bull. 75(3): 280. Sept. 1963. WR 112: 66
Earlier literature indicated that the dickcissel was once chiefly a meadow-nesting bird, but observations here reported showed them to be much more abundant along brushy roadsides than in meadows. Observations are given on winter status, flock sizes, and dates of migration and nesting.

Monk, J. P. (Glebe Cottage, Coring, near Reading, Berkshire, England.) THE PAST AND PRESENT STATUS OF THE WRYNECK IN THE BRITISH ISLES. Bird Study 10(2): 112-132, 5 figs. June 1963. WR 112: 66
Past and present status of the wryneck is given, on a county basis, for the British Isles. There has been a gradual decline in numbers of this bird in the past 100 years, and only 100-200 pairs bred in England in 1958.--From summ.

Paul, Adrian. (Kleena Kleene, British Columbia, Canada.) SOME OBSERVATIONS ON CLIFF SWALLOWS IN THE WESTERN CHILCOTIN DISTRICT OF BRITISH COLUMBIA. Murrelet 44(1): 9-10. Jan.-Apr. 1963. WR 112: 66
Nesting success was 60% among 63 breeding pairs.

Pulliainen, Erkki. (Univ. Helsinki, Helsinki, Finland.) THE INVASIONS OF THE KITTIWAKE (RISSA TRIDACTYLA) INTO FINLAND IN FEBRUARY AND MARCH 1959 AND 1962. Ornis Fennica 39(3): 81-96. 1962. [From Biol. Abstr. 43(3), 1963.] WR 112: 66
Both in 1959 and 1962 there was a clear invasion of the species into Finland after an interval of 32 years (1927-59). A corresponding invasion was observed in Finland in 1927.--From auth. summ.

Richdale, L. E. (Zool. Soc. London, London, England.) BIOLOGY OF THE SOOTY SHEARWATER PUFFINUS GRISEUS. Proc. Zool. Soc. London 141(1): 1-117, 3 figs. July 1963. WR 112: 66
This 117-page paper deals with the following subjects: pre-laying period, incubation, nightly arrival of shearwaters, hatching, description of chick, weights and measurements, feeding and related topics, attentiveness of parents, site tenacity, the shearwater community, survival and mortality, use of the burrows, northward migration, pair-bond and allied behavior. With about 80 references.

Siglin, Roger J., and Milton W. Weller. (Iowa State Univ., Ames.) COMPARATIVE NEST DEFENSE BEHAVIOR OF FOUR SPECIES OF MARSH BIRDS. Condor 65(5): 432-437, 2 figs. Sept. 1963. WR 112: 66
Summary: The reactions of four species of marsh birds to models and mounts of potential predators at the nest suggest that behavior is related to both nest site and social habits. Redwinged blackbirds, which nest close to shore or on shore, used pecking and mobbing to deter terrestrial predators. Yellow-headed blackbirds, which nest over water, were much less disturbed by terrestrial forms but reacted conspicuously to aerial predators. Less difference in nest site and behavior occurs between black and Forster terns, which both nest over water. Both showed highly social behavior and responded aggressively to any mounted animals near the nest.

Skutch, Alexander F. (El Quizarrá, San Isidro del General, Costa Rica.) HABITS OF THE CHESTNUT-WINGED CHACHALACA. Wilson Bull. 75(3): 262-269. Sept. 1963. WR 112: 67
Contains sections on food, voice, nest and eggs, incubation and young.

Swift, J. J. NOTES ON THE BEHAVIOR OF WHISKERED TERNS. Stat. Biol. de la tour du Valat, 6th Rept. p. 559-572. 1962. [From Auk 80(3), 1963.] WR 112: 67
An account of the behavior and breeding biology of Chlidonias hybrida, and comparisons with black terns.

Ven, J. van der. HET AANTAL BROEDPAREN VAN DE BLAUWE REIGER (ARDEA CINEREA L.) IN NEDERLAND IN 1956 EN '61. [THE HERONRIES OF THE COMMON HERON (ARDEA CINEREA L.) IN THE NETHERLANDS IN 1956 AND 1961.] Limosa 35(3-4): 266-269, 1 fig. 1962. [In Dutch with English summary.] WR 112: 67
In 1956 a census of the heronries of the common heron was made to compare the number of breeding pairs in that year with those of former censuses 1925/26, 1935/37 and 1949. The number of breeding pairs has increased slightly; 33 colonies still present in 1949 did not exist any longer in 1956, but 48 new, though generally smaller colonies were established. In 14 colonies (among which some important ones) an increase was established from 521 nests in 1956 to 804 in 1961. The total number of breeding pairs in 1961 therefore is estimated well over 5000.--From summ.

Venu, Ruth Smiley. (511 Walnut St., Salem, Va.) DRAMA IN BIRD LIFE. Raven 34(3): 41-43. Sept. 1963. WR 112: 67
A female house wren continued feeding her young after losing her ability to fly by running over the ground and up the tree containing her nest. The male did not aid with care of the young but deserted his mate.

Whitney, N. R. (633 South Berry Pines Road, Rapid City, S. Dak.) RESULTS OF PINON JAY BANDING IN SOUTH DAKOTA. Bird-Banding 34(4): 219. Oct. 1963. WR 112: 67
Of 95 piñon jays banded at Rapid City, S. Dak., in 8 years, 14 were recovered more than 3 months after banding. Seven of the birds had traveled short distances north or south, but one had traveled northwest 400 miles.

Young, E. C. (Univ. Canterbury, Christchurch, New Zealand.) FEEDING HABITS OF THE SOUTH POLAR SKUA CATHARACTA MACCORMICKI. Ibis 105(3): 301-318, 5 figs. July 1963. WR 112: 67
Skuas nested in association with the Adelie penguin (Pygoscelis adeliae), but predation on eggs and young of the penguin was slight. Proximity in nesting may be due to a shared habitat preference. Both parent skuas foraged when the chicks were being reared.

REPTILES AND AMPHIBIANS

Carpenter, Charles C. (Univ. Okla., Norman.) PATTERNS OF BEHAVIOR IN THREE FORMS OF THE FRINGE-TOED LIZARDS (UMA--IGUANIDAE). Copeia 1963(2): 406-412, 2 figs. 14 June 1963. WR 112: 67

Duellman, William E. (Univ. Kans., Lawrence.) AMPHIBIANS AND REPTILES OF THE RAINFORESTS OF SOUTHERN EL PETÉN, GUATEMALA. Univ. Kans. Publ. Museum Nat. Hist. 15(5): 205-249, 6 figs., 4 pls. 1963. WR 112: 67
Of the 78 spp. of amphibians and reptiles studied, 42% were partly or entirely arboreal.

Fitch, Henry S. (Univ. Kans., Lawrence.) NATURAL HISTORY OF THE RACER COLUBER CONSTRICTOR. Univ. Kans. Publ., Museum Nat. Hist. 15(8): 351-468, 4 pls., 20 figs. 30 Dec. 1963. WR 112: 68

Based upon 14 years of field study, 1,357 food records, more than 100,000 trap days, and a wide review of the literature (more than 6 p. of bibliography). The ecological relationships, home range, movements, food habits, reproduction, growth, mortality factors and adaptations for survival, and populations (composition and numbers) of the racer are considered.

Gorham, Stanley W. (Natl. Museum Canada, Ottawa, Ontario.) KEEPING SMALL AMPHIBIANS AND REPTILES IN HOME-MADE TERRARIA. Canadian Field-Nat. 77(3): 162-168, 1 fig. July-Sept. 1963. WR 112: 68

Information is given on equipment, food, temperature, hibernation and disease. Accounts on the care of approximately 20 spp. of amphibians and reptiles are included.

Hirth, Harold F. (Univ. Utah, Salt Lake City.) SOME ASPECTS OF THE NATURAL HISTORY OF IGUANA IGUANA ON A TROPICAL STRAND. Ecology 44(3): 613-615. Summer 1963. WR 112: 68

Summary: Sixteen iguanas collected on the Caribbean coast of Costa Rica, near Tortuguero, were basking or feeding at body temperatures between 33 and 38°C, the average being 36.2°C. Large individuals feed and bask at higher levels in trees than do small individuals. The diet of mature iguanas is entirely vegetation; juveniles may eat insects together with vegetation. Eggs are laid in the sand on the beach in March and April, and average 35 to a nest. Because of human predation, the numbers of iguanas on the tropical beach near Tortuguero are rapidly diminishing.

Lee, Anthony K., and Judith A. Badham. (Univ. Queensland, St. Lucia, Queensland, Australia.) BODY TEMPERATURE, ACTIVITY, AND BEHAVIOR OF THE AGAMID LIZARD, AMPHIBOLURUS BARBATUS. Copeia 1963(2): 387-394. 14 June 1963. WR 112: 68

The lizard is a heliotherm with a preferred range of body temperatures between 30 and 40°C, which includes 94 per cent of all activity observed. The rate of activity appears to be independent of body temperature within the preferred range. Heat storage, achieved by virtue of the mass of the lizard and opportunistic basking to temperatures approaching the maximum voluntary tolerance, permits the lizards to retain preferred temperatures when conditions favor heat loss. Relative independence of temperature and certain behavior patterns, such as feeding and threat display, are advantageous where the lizards spend long periods basking to preferred temperatures in the morning.--From abstr.

Lewin, Victor. (Univ. Alberta, Edmonton, Alberta, Canada.) THE HERPETOFAUNA OF SOUTHEASTERN ALBERTA. Canadian Field-Nat. 77(4): 203-214, 3 figs. Oct.-Dec. 1963. WR 112: 68

This is the first treatment of the herpetofauna of the extreme southeastern corner of Alberta. In addition to localities, dates, habitat preferences, relative abundances, ecology, and behavior of the 5 amphibian and 7 reptilian species found therein, there are detailed descriptions of the geology, botany, climate and pattern of land use of this arid short grass prairie region.

Mount, Robert H. (Ala. Coll., Montevallo.) THE NATURAL HISTORY OF THE RED-TAILED SKINK, EUMECES EGREGIUS BAIRD. Am. Midland Nat. 70(2): 356-385, 9 figs. Oct. 1963. WR 112: 68

Neill, Wilfred T. (122 Homecrest Rd., New Port Richey, Fla.) NOTES ON THE ALABAMA WATERDOG, NECTURUS ALABAMENSIS VIOSCA. Herpetologica 19(3): 166-174, 2 figs. Sept. 1963. WR 112: 68

The Alabama waterdog occupies relatively large streams containing leaves or other bottom debris beneath which it can hide. This animal is most active during the winter months on cold, stormy nights with wind and rain, and individuals in breeding condition can frequently be found during the winter months.

Webb, Robert G., Wendell L. Minckley, and James E. Craddock. (Texas Western Coll., El Paso.) REMARKS ON THE COAHUILAN BOX TURTLE, TERRAPENE COAHUILA (TESTUDINES, EMYDIDAE). Southwestern Nat. 8(2): 89-99, 3 figs. 31 July 1963. WR 112: 69

Box turtles are omnivorous and aquatic to semiaquatic in streams, ponds, and marshes; most turtles were obtained in marshes. The geographic range of T. coahuila, as determined by the extent of aquatic habitats, probably covers 300 square miles.--From abstr.

Weeks, S. E., and C. V. Davis. (Mont. State Coll., Bozeman.) MONTANA SNAKES. Mont. Wildl. p. 2-11, illus. Aug. 1963. WR 112: 69

A dichotomous key is given to aid identification of the 9 spp. of snakes occurring in Montana. Information is also given for each species on habitat, breeding, food, behavior and distribution. The prairie rattlesnake (Crotalus viridis) is the only poisonous snake occurring in Montana, and it is beneficial from the standpoint of its rodent diet.

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AUTHOR INDEX

	Page		Page
Adames, Abdiel J.	65	Bergerud, Arthur T.	46
Adams, W. V.	18,25	Berglund, Björn E.	58
Adler, Helmut E.	5	Bernard, Richard F.	62
Alarcon Navarro, Francisco	18	Besadny, C. D.	19
Alba, Aurelio Malaga	13	Betts, Monica M.	36
Aldrich, John W.	44	Bickford, C. Allen	4
Alkon, Philip U.	21	Bizeau, Elwood G.	11
Allan, Philip F.	3	Blakley, Earl R.	3
Allen, Virginia	8	Blood, Donald A.	26
Allison, Donald G.	45	Boag, D. A.	46
Alvarez L., Berta	19	Bonilla, J. A.	13
Ammann, G. A.	45	Bonn, Edward W.	15
Anderson, Roy C.	30	Boyd, Claude E.	6
Armed Forces Pest Control Board	6	Braaksma, S.	61
Arnold, David A.	31	Brander, T.	46
Arnol'di, K. V.	4	Brazda, A. R.	58
Arnol'di, L. V.	4	Brewer, Richard	40
Arthur, R. W.	41	Brooks, James W.	26,34
Aspelmeier, William	60	Brown, L. H.	40
Badham, Judith A.	68	Bump, Gardiner	12,46
Bailey, Edgar Preston	62	Burgess, Dent L.	3
Baird, J.	38	Bushman, John B.	23
Baldwin, Paul H.	63	Buss, Irven O.	55
Banks, Richard C.	39	Butler, Philip A.	6
Barbash, L. A.	21	Cade, Tom J.	36
Barker, S.	65	Calaby, J. H.	5
Barmore, William J., Jr.	26	Caldwell, J. Robert	58
Bartholomew, George A.	36	Calkins, Frank James	42
Bartoo, Ronald B.	15	Callison, Charles H.	4
Bates, James William	24	Canadian Wildlife Service	58
Bax, P. Napier	26	Cape of Good Hope	14
Baysinger, Earl B.	57	Carey, John B.	3
Beesley, W. N.	8	Carpenter, Charles C.	67
Belousova, A. A.	63	Catts, E. P.	14
Bennett, Carl L., Jr.	54	Chabreck, Robert H.	58
Berger, Daniel D.	45	Choate, Thomas S.	47

	Page
Choquette, L. P. E.	29
Christensen, Glen C.	47
Christensen, Roger	44
Cocozza, James	13
Conover, V. C.	14
Cornwell, George W.	58,59,64
Coulianos, C. C.	16
Coulson, J. C.	8,64
Cousineau, J. G.	29
Cowan, Archibald B.	59
Cowan, I. McT.	31
Craddock, James B.	69
Crawford, John E.	48
Crichton, V.	47
Crunden, Charles W.	47
Curry-Lindahl, Kai	58
Dahlgren, Robert B.	44
Dalke, Paul D.	48
Darsie, R. F., Jr.	14
Davies, S. F. M.	8
Davis, Betty S.	64
Davis, C. V.	69
Davis, John	64
Day, Benjamin W., Jr.	31
DeArment, Richard	50
Delvingt, W.	62
de Melo Carvahlo, Jose Candido	64
Desert Bighorn Council	27
DesMeules, Pierre	27
Dickey, Charley	12
Diem, Kenneth L.	15
Dimelow, E. J.	35
Dobrowolski, Kazimierz A.	62
Dol'nik, V. P.	36
Dorney, Robert S.	23,48,49
Dorst, Jean	9
Downs, Mrs. J. R.	64
Drury, W. H., Jr.	38
Dudzinski, W.	25
Duellman, William E.	67
Duffy, McFadden	59
Dugan, R. Franklin	3
Dunnet, G. M.	35
Durand, Forrest V.	2
East, Ben	31
Edwards, R. Y.	54
Egan, H.	7
Eisenmann, Eugene	64
Emigh, Frank D.	12
Eng, Robert L.	43,48
Engström, G.	21
Erard, C.	64
Erickson, Albert W.	24
Evans, Charles D.	14
Evans, W. H.	7
Farkas, T.	64
Farner, Donald S.	65
Fay, L. Dale	49
Ferguson, Denzel E.	6
Finley, Robert B., Jr.	7
Fish, N. A.	28
Fisher, Kenneth C.	23
Fisler, George F.	21,64
Fitch, Henry S.	62,68
Florschutz, O.	14
Fomushkin, V. M.	22
Frederickson, Leigh H.	62
Free, Stuart	33
Freeman, Orville L.	2
Frings, Hubert	13
Frings, Mabel	13
Gabrielson, Ira N.	2
Galindo, Pedro	65
Galuzo, I. G.	17
Gamble, Hays B.	15
Game Research Association	14
Gardner, R. W.	33
Garland, Lloyd E.	3
Gashwiler, Jay S.	23
Gast, James A.	9
Geis, Aelred D.	59
Gibb, J. A.	36
Gilfillan, Merrill C.	63
Glover, J.	27
Goates, Morris A.	22
Gobeil, Robert E.	37
Golovin, O. V.	17
Goodpasture, Katherine A.	37
Goodwin, Harry A.	59
Gorham, Stanley W.	68
Graber, Jean W.	41
Graber, Richard R.	41
Grant, Martin L.	39
Green, Betty	25
Greenhalgh, Clifton M.	12
Greer, Betty	18
Greer, Kenneth R.	51
Gusev, V. M.	42
Guseva, A. A.	42
Haber, A.	25
Hale, James B.	8,49
Halloran, Arthur F.	27
Hamerstrom, F. N., Jr.	45,49
Hamerstrom, Frances	45,49
Hancock, Norman V.	2
Hanson, R. C.	58
Hanson, R. P.	10
Harper, Harold T.	12,49
Harris, Grant A.	2
Harrison, George H.	24
Harrison, J. G.	65
Harrison, J. L.	17
Harrison, J. M.	65
Hartman, F. A.	37
Hayes, Frank A.	32
Hayward, C. Lynn	39
Henze, [O].	18
Herman, Carlton M.	49
Hester, Albert E.	9
Hesterman, E. R.	19
Higler, L. W. G.	65
Higuchi, Sukesaburo	17
Hiltibran, Robert C.	15
Hines, John Q.	39

Hines, William W. 31
Hirth, Harold F. 68
Hoffman, Donald M. 50
Hoffman, Wallace R. 2
Holmes, Edward D. 11
Holmes, R. Bruce 50
Hood, Glenn A. 13
Hornberger, F. W. 25
Houston, C. Stuart 9
Huang, Sheng-I. 42
Hughes, William M. 65
Humphrey, Philip S. 37
Hunt, Eldridge G. 7
Hunt, George S. 59
Isaac, Donald 65
Isaacson, A. J. 57
Ivanova, E. I. 34
Jackson, A. S. 50
Jackson, George T. 3
Jahn, Laurence R. 2
Janse van Rensburg, Rex D. 25
Jeffrey, Duane Eldro 27
Jehl, Joseph R., Jr. 61
Jenkins, David 51
Jensen, G. H. 58
Johnels, A. G. 16
Johns, J. E. 9
Johnson, Robert A. 43
Johnston, Richard F. 63
Jones, Robert E. 51
Jonkel, Charles J. 51
June, James William 52
Kahl, M. P., Jr. 61
Karstad, Lars 28
Kay, L. 18
Keith, Lloyd B. 62
Kendeigh, S. Charles 9
Kennerly, Thomas E., Jr. 22
Kent, Fred W. 62
Kenyon, Karl W. 60
Kettlitz, W. K. 9,28
Keymer, I. F. 8
Khanemedov, A. I. 52
Kilham, Lawrence 65
Killpack, Merlin L. 39
King, Calvin L. 14
King, James R. 65
Kline, Paul D. 19
Klugow, Bernard 62
Koehler, James W. 41
Kogon, C. 19
Kolenosky, G. B. 29
Korol'kova, G. E. 12
Kupa, John J. 53
Kverno, Nelson B. 13
Lack, David 37
Lamprey, H. F. 28
Lane, Henry C. 3
Lauppe, Earl 31
Lawrence, Carl B. 3
Layne, James N. 22
Ledger, H. P. 13
Lee, Anthony K. 68
Lee, Levon 28
Lee, S. L. B. 37
Lee, V. H. 10
Lehmann, V. W. 52
Lehrman, Daniel S. 57
Leopold, A. Starker 5
Lesser, F. H. 14
Lessler, M. A. 37
Levit, A. V. 17
Lewall, E. F. 31
Lewin, Victor 68
L'Heritier, M. 22
Lightfoot, William C. 32
Lindqvist, Ossi 39
Ling, H. 28
Ling, P. G. 60
Liversidge, R. 63
Lloyd, H. G. 20
Longley, William H. 24
Lovell, J. Byron 7
Lumsden, Harry G. 52
Luther, Hans 58
Lyall-Watson, Malcolm 25
Lynch, John J. 14
Lyon, L. Jack 11
MacDonald, Duncan 56
MacDonald, J. W. 41
Mace, Robert U. 56
Mackay, Violet Meekins 65
Macmillan, A. T. 66
Marchant, S. 39
Marchelewski, J. H. 52
Marchette, Nyven J. 23
Marler, Peter 65
Marshall, Charles M. 32
Marshall, William H. 25,53
Martin, Fant W. 60,61
Matuszewski, G. 25
Mauermann, R. G. 52
Maw, Vernon 32
Mayer, Carl E. 4
Mayhew, J. K. 16
Mayhew, Wilbur W. 37
McCandless, James B. 37
McCarley, Howard 23
McGinnes, Burd S. 10
McGowan, John E. 28
McGrath, Raymond 46
McIntosh, D. L. 26
McNab, Brian K. 22
Meanley, Brooke 38,66
Mendez, Eustorgio 65
Menzel, Karl E. 56
Merz, Robert L. 57
Messersmith, Donald H. 40
Mezzottoni, C. 13
Michurin, L. N. 28
Milbrandt, Allen C. 3
Miller, A. Wendell 60
Miller, G. R. 51
Minckley, Wendell L. 69

	Page
Mohle, Paul H.	3
Mohler, Levi L.	53
Monk, J. P.	66
Moore, Joseph Curtis	34
Moore, Mary	18,25
Moran, Richard J.	53
Mount, Robert H.	68
Moyle, John B.	24
Murton, R. K.	57
Mussehl, Thomas W.	53
Neill, Wilfred T.	68
Nelson, Harvey K.	60
Nero, Robert W.	40
Newman, Kay	18,25
Nichols, Lyman, Jr.	28
Nisbet, I. C. T.	38
Nish, Darrel H.	43
Nord, Warren H.	2
Nordstrom, Goran	38
Novakowski, N. S.	29
Nygren, Larry Rene	53
O'Donoghue, P. N.	36
Okhotina, M. V.	18
Olsson, Viking	58
Ortiz Mariotte, Carlos	17
Ouellet, Henri	40
Ouellet, Réginald	40
Owens, Dwight E.	29
Palmer, Walter L.	53,54
Parkes, Kenneth C.	37
Paul, Adrian	66
Peacock, L. J.	61
Pearson, Oliver P.	22
Pejler, Birger	60
Peller, Edith	7
Pengelley, Eric T.	23
Pengelly, W. Leslie	29,32
Pennie, I. D.	36
Perring, F. H.	4
Peters, Stuart S.	46
Peterson, Berkeley R.	10
Pickvance, T. J.	18
Pielowski, Zygmunt	62
Pikula, J.	40
Pillmore, Richard E.	7
Pinnock, D. E.	51
Pinowski, Jan	62
Platt, Dwight R.	63
Poole, W. E.	20
Prawdzik, Thomas R.	54
Proctor, John	25
Proffitt, William H.	3
Pruitt, William O.	29
Pulliainen, Erkki	66
Pyrah, Duane B.	48
Rae, B. B.	34
Ratcliffe, D. A.	62
Reynolds, Hudson G.	29,32
Rice, Dale W.	34
Richards, Gerald L.	39
Richards, Stephen H.	17
Richdale, L. E.	66
Riddle, Oscar	38
Riecke, F.	41
Rieger, Samuel	4
Riley, Charles V.	16
Ritcey, R. W.	54
Ritchie, A. T. A.	29
Roberts, Harvey A.	32
Robeson, Stacy B.	43
Robinson, Don	29
Robinson, Thane S.	43
Rodhe, Wilhelm	58
Rogers, Glenn E.	55
Rose, J. H.	8
Roth, Earl E.	18,25
Rowe, F. P.	23
Rowley, Ian	20,21
Runkel, Sylvan T.	16
Ryel, L. A.	45
Sage, Bryan L.	38
Sanford, G. E.	18,25
Sargeant, Alan B.	10
Schierbaum, Donald L.	21
Schlatterer, Edward F.	48
Schmid, Frederick C.	62
Schmidt, Gerald D.	8
Seaman, George A.	32
Sellerburg, Gunnar	58
Severinghaus, C. W.	33
Shaposhnikov, L. V.	17
Sharp, Ward M.	55
Sheldrick, D. L. W.	26
Shmit, E.	61
Shuyler, Harlan R.	42
Sieh, James G.	60
Siglin, Roger J.	66
Siniff, Donald B.	24
Skutch, Alexander F.	67
Sleptsov, M. M.	34,35
Smith, Anthony	10
Smith, Neil D.	55
Smith, R. H.	58
Smith, Ralph H.	10
Smith, Robert Irvin	61
Smith, S. E.	33
Smith, W. John	38
Soileau, Larry	57
Sokolov, V. E.	35
Sorokin, M. G.	17
Soutar, N. M.	7
Spitz, F.	10,22
Springer, Paul F.	6
Stains, Howard J.	10
Stanton, Don C.	48
Stempel, M. E.	43
Stenmark, A.	21
Stewart, D. R. M.	30
Stewart, Paul A.	63
Stokes, Allen W.	55
Straley, James H.	30
Stupka, Arthur	40
Suetsugu, Harvey Y.	56
Sumiński, Piotr	17

Page

... 38
... 41
... 4
... 16
... 54
... 29
... 32
... 43
... 29
... 43
... 58
... 55
... 8
18,25
... 23
20,21
... 16
... 45
... 38
18,25
... 10
... 21
... 48
... 62
... 8
... 32
... 58
... 33
... 17
... 55
... 26
... 61
... 42
... 60
... 66
... 24
... 67
34,35
... 10
... 55
... 58
... 10
... 61
... 33
... 38
... 57
... 35
... 17
... 7
10,22
... 6
... 10
... 48
... 43
... 21
... 30
... 63
... 55
... 30
... 40
... 56
... 17

Page

Sutton, George Miksch 43
Svanbaev, S. K. 30
Swanson, G. A. 33
Swift, J. J. 67
Talbot, Lee M. 30
Talbot, Martha H. 30
Tamsitt, J. R. 18
Tarakanov, A. D. 17
Taylor, A. 7
Taylor, R. John 23
Teer, James G. 33
Tembrock, Gunter 6
Thearle, R. J. P. 7
Thompson, G. B. 42
Thompson, Harry V. 21
Thompson, Richard L. 10
Thompson, Wayne H. 8
Thorpe, Bert D. 23
Timmerman, A. 61
Tindall, E. E. 14
Toivari, Lauri 39
Tomlinson, Roy E. 55
Trainer, Daniel O. 8,10
Turemuratov, A. T. 42
Turtle, E. E. 7
Udagawa, Tatsuo 8
U. S. Dept. Interior 3
Uspenskii, S. M. 5
Valdivieso, Dario 18
Ven, J. van der 67
Venu, Ruth Smiley 67
Verme, Louis J. 31,33
Villa-R., Bernardo 19
Vince, M. A. 39
Vinson, S. Bradleigh 6

Page

Va. Comm. & U. S. Natl. Forests .. 16
Wagner, H. O. 39
Walters, S. M. 4
Ware, Kenneth D. 4
Warren, R. P. 39
Wasilewski, Aleksander 62
Watson, Adam 51
Watson, George E. 39
Webb, Robert G. 69
Wecker, Stanley C. 23
Weeden, Robert B. 52,56
Weeks, S. E. 69
Weidenmüller, H. 21
Weisenberger, B. C. 4
Weiss, G. H. 8
Weller, Milton W. 62,66
Western Assoc. State Game & Fish Comms..... 11
Westerskov, Kaj 44
Weston, Henry G., Jr. 42
Westwood, N. J. 57
White, Clayton M. 42
Whitney, N. R. 67
Wight, Howard M. 57
Williams, G. R. 44
Williams, Verne O. 5
Wilton, G. S. 29
Wright, E. N. 7
Yaworkski, Michael 3
Yeatter, Ralph E. 56
Yocom, Charles F. 40
Young, E. C. 67
Yudin, B. S. 19
Zaczkowski, Nick K. 63
Zyl, J. H. M. van 13

Manuscript for this issue was completed 13 March 1964

Addition to Author Index:

Comes, R. D. 15
Frank, P. A. 15
Hodgson, R. H. 15

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